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## THE MOTION PICTURE INDUSTRY AROUND THE WORLD

Although Systematically Developed for Less than a Decade, it Now Represents an Investment of Over \$100,000,000 and Employs More than 200,000 People

By Thaddeus S. Dayton, New York City

THE making of motion pictures is the newest of great American industries. In the last five years it has assumed tremendous proportions. To-day more than three-fourths of the world's consumption of moving picture films is supplied from the United States. The money that changes hands in the international commerce in this article—a commodity, or class of merchandise, practically unknown a decade ago—now runs into many millions of dollars.

Records indicate that the first moving picture machine was patented in 1867. It possessed little merit, but it was the beginning. In 1893 the "cinematograph" was produced by Lumière. This was the first machine to project the pictures on the screen direct from the film. Edison improved upon this, and, in 1896, produced the "Vitascope." These two machines are the basis from which the wonderful instruments of to-day have been evolved. Originally the films were crude affairs, 75 feet in length. One thousand feet is now the standard. The difference between the two, great as it is, is not so striking as the increase in the industry itself.

Motion pictures became a "craze" that began to spread all over the world only seven or eight years ago. From a mere novelty and a means of amusement at low prices they have become rivals of the regular theaters—competitors so compelling that they have brought about many important changes in the commercial and artistic sides of the spoken drama. To-day new uses are being found continually for motion pictures. They are employed to sell goods, to educate, and even to preach the moralities. Hardly a phase of modern life is not touched by them.

The principal reason why the United States has become the chief producer of motion picture films is the vast audience that daily watches the lights and shadows dance across the screen in the cities, towns and hamlets of America. According to statistics gathered some six months ago, 20,000,000 persons a day spend an average of five cents each to see the "movies." In the producing and exhibiting of motion pictures in the United States more than \$100,000,000 is invested and about 200,000 persons are employed. Considerably more than 10,000,000 feet of picture films are produced weekly. This means that the aggregate production, so far as can be gathered from the incomplete statistics obtainable, is something like 100,000 miles a year—enough to reach four times around the globe at the equator.

As a matter of fact, the production of motion picture films in the United States and in Europe is increasing so rapidly that the figures of last year, or even of last month, only serve as an indication of the figures of to-day.

The first fiscal year in which the United States Government began recording the exports of motion picture films was 1912. These records of the Department of Commerce are taken from shippers' manifests, and show that in that year 80,035,302 feet of films were shipped to foreign countries, and that 14,274,768 feet were imported. The declared value of the former was \$6,815,060, and of the imports, \$825,083. It was estimated that the exports of motion picture films were increasing at the rate of 100 per cent. a year, and that the imports, while growing annually, were declining in their proportion to the total international trade. The 1913 statistics showed exports of about 25,000

miles, or some 142,000,000 feet. It was stated that last year about 75 per cent. of the aggregate output of all countries was made in the United States—putting that country far in advance of all others in this industry.

These figures, however, stupendous as they are, apparently are much below the actual, so far as exports from the United States are concerned. Inquiries made of three of the largest companies or combinations of companies producing motion pictures in the United States have elicited the statements that each of these concerns is exporting a minimum of 300 reels of "positive" picture films a week. Each reel is 1,000 feet in length. This would make the total exports of these three enterprises alone about 50,000,000 feet a year. There are literally hundreds of other companies—large and small—in the United States that are producing and ex-



Courtesy Universal Film Mfg. Co.

Few classes of films have had a more world-wide popularity than those depicting Indian scenes. This one is from "The Legend of the Phantom Tribe"

porting their films. An analysis of the various estimates of the total exports indicates that they amount at present to about 528,000,000 feet a year. These are all "positive" films, ready to be placed in the projector and thrown upon the screen. Each film is placed in a tin can about 12 inches in diameter and one inch thick. From this universal method of packing the "canned drama" has received its name.

When the picture is taken by the camera the film on which it is recorded and developed is called the "negative." From this the "positive" films are made. A great number of "positives" may be made from a single negative. Therefore the negatives are always carefully guarded in the vaults of the producing companies. They are prac-



Courtesy Universal Film Mfg. Co.

Two scenes from the six-reel feature film "Samson," which tells the Bible story with a wealth of oriental color

tically never exported, leased or sold. The head of one of the largest film producing companies in the United States told the writer that if it were not for the export trade, three-fourths of the motion picture producers would have to go out of business. The reason for this is the high cost of producing films in America, as compared with other countries where the salaries are much lower. In the United States the "supers" are paid \$2.50 a day in California, and \$5 a day in New York. A horse and rider receives double these figures in the respective localities. A "leading man" draws from \$150 to \$300 a week, and a "leading woman" from \$250 to \$400. Other actors—"principals"—receive from \$40 to \$60 a week. These salaries are several times greater than have to be paid by European producers. The film stock costs about the same throughout the world, but the "factory costs" in Europe are about one-fourth what they are in the United States, owing to cheaper labor.

These items of expense, together with the many others that go into the making of a single reel of film in the United States, bring the average cost of each thousand feet of negative to between \$700 and \$1,000, according to the varying conditions under which it is made. In the United States the film producing company receives about 10 cents net a foot from the films it leases to exhibitors. This, they say, amounts to about the cost of production and other expenses, and leaves them little profit, if any, from their domestic business.

But once the negative films are made, the positives can be produced quickly and at the cost of the film, the print-

A scene from reel two of "The Tragedy of the Desert," which was actually posed in the Desert of Sahara

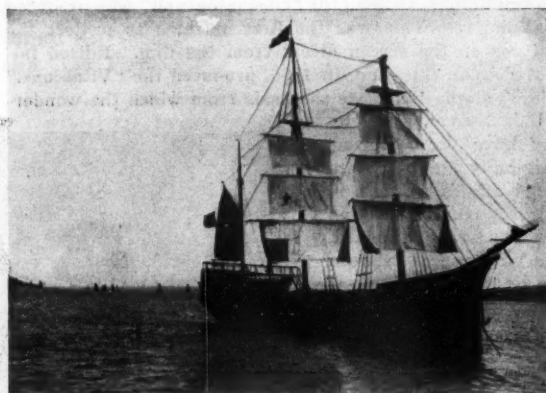
Courtesy of the Kalem Co.



ing, shipping and marketing. The average price at which American films are leased abroad brings the United States' manufacturer-exporter about 8 cents, net, a foot. This, however, is almost clear profit, if the film has met with ordinary success in the United States and has paid for itself there.

Some producers ship positives of every production to their foreign offices or agents for sale throughout the world; others export only about three-fourths of their domestic product, choosing things that they think will be best suited for the foreign market. The tendency, however, is, when buying scenarios, to select those subjects that will have as nearly a universal appeal as possible. Therefore it may be assumed that nearly nine-tenths of the pictures made in the United States are exported in "positive" form.

Practically every motion picture that is produced in the United States is passed upon by the National Board of Censors—a private body that has the hearty approval and backing of the motion picture producers, because they have



Courtesy of the Kalem Co.

General Wolfe's original flagship used in the "Fall of Quebec" and Gordon Highlanders covering British retreat at the first repulse

found it is unprofitable to produce photo plays that contain objectionable incidents.

Nearly every important foreign country has its own official board of censors who pass upon the motion pictures made in or imported into the country. This censorship is exercised everywhere before the pictures are publicly exhibited. The rules of the censors vary with each country, but the American producers ship all over the world, and therefore they do not make their pictures specifically for any one market, or to conform especially to the rules of any one country.

In Germany, for instance, where the Government censorship is very rigid, anything that shows disrespect to a police officer or a soldier or sailor, of any rank, must be cut out of the film. In the United States the "comic policeman" is one of the comedy standbys. But in Germany a policeman is a policeman, no matter what uniform he wears in the film, and unless he is treated with the utmost respect in the picture, out he has to come.

On the other hand, European censors pass without question certain motion picture scenes that are not allowed by the censors in America. The question of censorship is a big one. It has been the subject of endless discussion. Its basis in each country is racial, or is the result of local customs, manners and usages.

Two or three years ago the films most in demand abroad were those showing cowboy and Indian life in North America. The taste of foreign audiences has changed, however. Scenes of this sort are not nearly so much in demand now as they used to be. This is particularly the case in Continental Europe and in Great Britain. What is demanded now is the logical melodrama, full of strong situations—"stuff with a thrill in every scene," as one American producer puts it. Also the ordinary photo play that has one big feature—some daredevil act—seems to have a universal appeal. The demand is growing, too, for scenes of life in America—in both city and country—through which runs a thread of a story. Not long ago only historical productions exceeded one reel in length.



Courtesy Kalem Co. and Edison Studios

Upper illustration shows a scene from "The Street Singer" (Kalem Co.); lower, "What Happened to Mary" (Edison Studios)

Now anything that is of sufficient sustained interest may run from three to six reels. The latter is long enough for a whole evening's amusement.

Broadly speaking, "real people and real things"—portrayals of everyday life with unusual or striking incidents, no matter what the setting or the costumes—are liked by every nation or race on earth. Only in the character of the incidents shown in the pictures are strong preferences shown. For instance, in Japan the most popular kinds of pictures—in the order named—are those showing heroism, pathos, magic, comedy, educational subjects, and scenic views. Love stories, pictures of policemen or Government officers fooled or mocked by the people, and pictures which instill revolutionary ideas into the heart of youth are banned by the censors and by the public taste.

In Great Britain and her colonies the same class of subjects popular in the United States is most in demand.

In Russia the most popular films are those founded on the older and better-known grand operas. Next come



Courtesy Universal Film Mfg. Co.

Two scenes from "Won in the Clouds" for the preparation of which an American company was sent into the interior of Africa

nature scenes, especially those depicting wild and savage life. American scenery and sporting events, such as baseball and football, are well liked.

South America likes views of the great cities of the United States and Europe, the working of great factories, steel mills, etc., scenes of amusement parks, summer resorts, naval and army reviews, college athletics, fire scenes, and farming by machinery. Comic subjects also are in great demand, for the people are great lovers of things showing the lighter side of life.

The Germans like scenes from American history, negro life in the South—especially on the cotton, sugar and fruit plantations—county fairs and traveling circuses, outdoor life and sport, student life at the great American universities, scenes in cities, hunting experiences, and pictures showing the processes of typical American industries.

In Turkey, American films are preferred because of their clearness, their gripping plots and the vivacity and naturalness of their actors. The American heroine is especially popular. Films showing the exploits of American detectives are well liked.

Mere scenery without any story or plot is not popular anywhere—at least the American film manufacturers place that at the foot of the list from the point of view of demand. Their experience is the same as the producers of films in other parts of the world. Of course, Niagara Falls, the Yosemite, the Yellowstone National Park, and other great natural wonders of the earth, have a steady sale, but even views of this sort are now being used as backgrounds for plots. Audiences everywhere seem to like

Miss Mary Fuller in "Aida." Films depicting the leading grand operas are at present very popular in many countries

Courtesy Edison Studios.



to be instructed without the educational effort being obvious.

London has become the great selling center for motion pictures abroad. Every large American producing concern has its main office in London to take care of its export trade. The biggest companies have branch offices in every important city in Great Britain and on the Continent. Most of the South American trade, however, is supplied directly from New York City.

In the United States the universal custom is to lease the films to exhibitors, the films remaining the property of the producing or leasing company. This custom is not adhered to in the foreign business. World distances are too great. By the time a rented film was returned from Australia or China, for instance, it would be too old to put out again. Therefore many of the films—"positives" only, of course—are sold outright to lessors in nearby as well as in far-off countries. The renting companies acquire exhibition rights for certain districts with whose local tastes they are intimately familiar. Then, if they wish to resell their films, they can do so through various exchanges. Generally speaking, the oldest, most wornout films, that have been shown many times and in many places, are seen last of all in the native cities in China, India and other distant places. By the time they reach there they are badly battered. Often they have been patched so many times that the thrilling incident on which the story depends has been cut out in the repairing process. Finally, the films are dissolved for the fifty cents worth of silver that enters into the composition of each reel that can be precipitated by the use of chemicals. That is the end of every film, scenic or sentimental, tame or thrilling.

The imports of films into the United States have as their greatest features the three to six or more reel productions of historical scenes, or romances that are classics. Of course a certain quantity of thrillers and scenic pictures come in also, but unless these are manifestly superior to anything of home production that is on the market, they are not much in demand. The commercial axiom that the



Courtesy Mutual Film Corporation.

The thrilling 60 foot leap in "The Great Leap," one of the sensational films of the year

best selling article is what the people like is true in the motion picture industry as in anything else. Apparently the American motion picture has certain points of superiority over all others which makes it preferred abroad as well as in its native land.

While foreign producers have made some magnificent and expensive photo plays, the era of such productions, which had their beginning abroad, seems to be on the threshold of its greatest development in America. Each year, in the United States, sees several of these great series of films, costing many tens of thousands of dollars. The newest one is usually the most expensive of all to produce. The cost is no object, for the public flocks to see them, they have a long life, and the percentage of failures is surprisingly small.

To get a realistic *milieu* the producers will spend any amount of time and money. One day, for instance, William Wright, the general manager of the Kalem Company, had an idea that a picture story of the life of Christ, made in Palestine by the best actors that could be secured, would be interesting and instructive. He talked it over with his associates in the next half hour, then started sending messages by the land telegraph and cable. That night two score of the best actors in the winter company that was making pictures in Florida started for New York. As soon as they arrived in New York they embarked for London. In London they were joined by other famous players that had been engaged there by cable. A hundred set sail for Palestine.

Meanwhile, several of the greatest antiquarians, specialists on Palestine and the early history of the Christian religion, were engaged. These sailed with the company. Nothing was spared to make the production historically accurate in every detail.

This photo play took nearly a year to make. It was in five reels and cost the producers \$100,000—twenty times as much as the ordinary film. But it has been exhibited all

(Continued on page 92.)

Scene from "The Girl and the Bandit," a Western cowboy drama of a type that is popular throughout the world

Courtesy Universal Film Mfg. Co.



A scene in "The Impersonator"—an admirable study in expressions, listening to a stirring speech in the House of Representatives

Courtesy Edison Studios.



## THE REPUBLIC OF HONDURAS

New Railways, now in Course of Construction, will soon Revolutionize Economic Conditions in this Central American State

By Edward Neville Vose, Editor of "Dun's International Review"

**I**N sharp contrast with Nicaragua and Panama, the Republic of Honduras is one regarding which very little indeed has ever been published in English or in any language other than Spanish. Its bibliography, even including works in Spanish, is very meagre and there are scarcely half a dozen books all told that give any recent and reliable data regarding the country's natural resources and its industrial and commercial development. Although the population of Honduras is considerably larger than that of Panama, its foreign trade is the smallest of any of the Central American republics, and is even smaller than that of the colony of British Honduras, which has a population barely one-fourteenth as large. This situation, however, will undoubtedly soon disappear as a result of the new railway now being constructed to connect the capital with the Atlantic seacoast. This epoch-making improvement will open up large areas for development and will no doubt stimulate industry and commerce throughout the entire republic.

**SITUATION AND BOUNDARIES.**—Although it extends clear across Central America, by far the greater part of the area of Honduras lies on the Atlantic slope, its coast line on the Caribbean being approximately 400 miles in length as compared with 70 miles of frontage on the Pacific side, in the Bay of Fonseca. For the greater part of its length the Caribbean coast line extends due East and West, which is also the direction of the greatest length of the republic. In latitude Honduras extends from 13° 10' to 16° 10' N., and in longitude from 83° 10' to 89° 30' West from Greenwich. Its area is estimated to be 46,250 square miles, or 6,000 less than that of Guatemala and about 4,000 less than that of the State of Pennsylvania. It is the third largest of the Central American republics. It is bounded on the North by the Caribbean Sea, on the East and South by Nicaragua and the Gulf of Fonseca in the southeastern part, and on the South by Salvador in the central and western portion, while Salvador and Guatemala form the western boundaries. The colony of British Honduras does not touch the boundaries of the Republic at any point, being situated on the opposite side of the Bay of Honduras, the southern shores of which belong to

Lemoa and the River Guascorán that with Salvador, and the River Negro, the Dipilto Mountains and the River Coco that with Nicaragua. The Bay Islands, situated 25 to 50 miles off the north shore and having an estimated area of 200 square miles, also belong to Honduras.

**POPULATION.**—The total population reported in the Official Census of 1910 was 553,446; and December 31, 1911, the total reported was 566,017, or 12.2 inhabitants per square mile. The population has increased rapidly since 1881, when it was reported to be 307,289. In 1887 a census was taken which gave the total population as 381,938, and in 1901 the total number reported was 489,367. The bulk of the inhabitants consists of Indians, of whom about



Courtesy William V. Alford.

A memento of a dead civilization—one of the idols at the ruins of Copan

90,000 are uncivilized. The remainder of the native population is mainly of Spanish descent, with a considerable number of negroes of West Indian origin along the Caribbean Coast.

**PHYSICAL CHARACTERISTICS.**—Like Guatemala and Salvador, Honduras is essentially a mountainous country. The volcanic coast range, which forms so striking a feature of the orography of Salvador, is completely interrupted on the mainland by the de-



Courtesy Pan-American Union.

General view of Tegucigalpa, the capital of Honduras, and almost the only important capital in the world not yet reached by a railway

Guatemala. Although there have been a number of boundary controversies in the past, the limits are now fairly well established, the Sierra de Merendón forming the boundary with Guatemala, certain affluents of the River

pression around the Gulf of Fonseca, but re-appears in the islands of the Gulf. The Cordillera of the interior of Guatemala, however, after crossing the frontier into Honduras extends clear across the country in an easterly direction and into the neighboring Republic of Nicaragua. At the point where the boundaries of Guatemala,

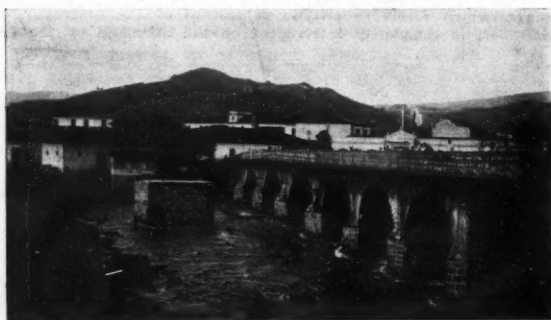
Honduras and Salvador meet, the Sierra de Merendón diverges from the main chain and extends in a northeasterly direction clear to the shores of the Caribbean Sea. This range has a mean altitude of nearly 7,000 feet and attains 10,000 near its northern extremity, thus forming a natural as well as political boundary with Guatemala, and a complete watershed between the River Motagua of Guatemala and the River Chamelecón of Honduras. The heavy rainfall of the rich Ula River valley is largely due to the situation of this range. The main range of the Sierra Madre continues along the Salvadorean frontier in a general southeasterly direction to the head waters of the Guasacarán, which forms the boundary between the two republics to the sea. Here the range deflects somewhat sharply northward and merges with the Lepaterique Mountains, which extend eastward to the depression formed by the River Choluteca. At the point where the River Guasacarán breaks through the mountains is a depression which may be said to extend from ocean to ocean as the head waters of that river rise in the same plain as those of the River Humuya, the chief affluent of the River



Courtesy William V. Alford.

One wall of a room at the top of one of the pyramids in the ruins of Copan

Ula. This is the Plain of Comayagua, which is only 1,800 feet above sea level. The two river valleys therefore form a natural pass for a railway line of moderate grades from one coast to the other, which would pass through or near the principal centers of population. North of the Lepaterique Mountains a series of nearly parallel ranges, having their main axes running East and West, extend northward to the sea. These are known as the Comayagua, Sulaco and Pija Mountains, respectively. These, with their projecting spurs and the intervening plains and valleys, form a mountainous tableland covering the entire central portion of the country. Mt. Congrehoy, near the coast at La Ceiba, attains an altitude of 8,040 feet, and is visible from a considerable distance out at sea. The Campamento Mountains form the final rampart of this tableland toward the north in the central portion, while in the direction



Courtesy Pan-American Union.

New stone bridge, costing 150,000 pesos, connecting Tegucigalpa with Comayagua

of Nicaragua the Misoco Mountains and the boundary range of the Dipilto Mountains terminate the system, the latter forming the watershed between the Patuca and Coco Rivers. All of these mountains show evidences of volcanic origin, but none have been active during historic times.

The river system of Honduras comprises the Guasacarán and Choluteca on the Pacific side, both flowing into the shallow Gulf of Fonseca, the shores of which belong to three republics. The former serves as the boundary with Salvador for part of its length, but the latter is wholly within Honduran territory and is navigable for light draught vessels for some distance inland. On the Atlantic side the rivers are more numerous and far larger. The Chamelecón and the Ula together drain a very extensive valley which extends inland to the foot of the central mountain range and is enclosed between the Merendón Mountains on the West and the mountainous

tableland running northward to the vicinity of La Ceiba on the East. This valley, known as the Valley or Plain of Sula, is very fertile and is commercially one of the most important regions in the country. The Chamelecón is rapid and filled with shallows. The Ula is navigable for river vessels for a considerable distance, but its mouth is obstructed by a bar. To the east of the Valley of Sula is a tableland covering the Departments of Yoro and Olancho, and here the country slopes gradually toward the sea in a broad plain which is drained by the Rivers Aguán, Negro, Patuca and Coco—all of which flow northeast. This region is covered with dense tropical forests and, except for its higher portions, is very sparsely inhabited. The Coco—also called the Segovia, the Wanks and by several other names—is the largest river in Central America, rising only a few miles inland from the Bay of Fonseca, but only its western banks and affluents are in Honduran territory.

**CLIMATE.**—As in all mountainous regions situated in the tropics the climate of Honduras is determined by altitude as well as by the latitude and varies considerably in different parts of the republic. The *tierra caliente* on the Pacific coast is confined to the Guasacarán and Choluteca valleys and the lowlands around the Gulf of Fonseca, while on the Atlantic side it includes the broad valley watered by the Chamelecón and Ula Rivers and the broad slopes and savannas drained by the Aguán, Patuca and Coco Rivers. The low tablelands which cover nearly two-thirds of the country are sufficiently elevated to belong to the *tierra templada*, the mean annual temperature of the principal towns, Tegucigalpa, Comayagua, Juticalpa and Gracias, being 74° F. The coldest month at Tegucigalpa is December, and the hottest May. On the Atlantic slopes the moisture-bearing trade winds from the Caribbean modify the temperature somewhat, but cause an almost continuous rainfall, except from June to September, when the winds are intermittent. In the interior highlands and plateaux, and on the Pacific slope, the rainy season begins in May and ends about the middle of November, this being the *invierno*, or Winter. The dry season is from November till May and is called the *verano*, or Summer. The average rainfall in the region of densest population, around Tegucigalpa, is about 48 inches per annum, but on the low Atlantic coastal plains it is much greater. Severe storms are rare and West Indian hurricanes are unknown.

**HISTORY.**—In the Department of Copán, at the extreme western extremity of Honduras, near the Guatemalan frontier, are numerous remains of a great Indian city dating from a period so remote that no remembrance of it existed among the tribes inhabiting the country at the time of the Spanish conquest. Stone columns, terraces and stairways, half-hidden among the luxuriant foliage of the tropics, are all that are now left of what were once vast palaces or temples. Numerous monuments, carved with fantastic human figures and grotesque animals, bear on their sides hieroglyphics that no doubt would tell their meaning and original purpose if they could be interpreted. The secret of this ancient writing, however, has been lost, and as yet the exact age of these impressive monuments of a dead race and a forgotten civilization has not been determined.

The first European to step on the soil of Honduras was Columbus, who discovered the island of Guanaja, or Bonaca, the most easterly of the Bay Islands, on his fourth voyage. Seeing high mountains in the distance to the southward, he sailed in that direction and landed at Cape Honduras, near the present port of



Courtesy Pan-American Union.

Government Hospital at Tegucigalpa, showing somewhat primitive paving soon to be improved

Trujillo, on the 14th of August, 1502, taking possession of the country in the name of the King of Spain. The great navigator then sailed eastward along the coast to Cape Gracias a Dios, to which he gave its pious name in gratitude for a cessation of the stormy weather he had hitherto encountered. Some twenty years later Cortés, the conqueror of Mexico, made an expedition across what are now the Republics of Guatemala and Honduras, and thereafter Honduras was regarded as a part of the Captain-Generalcy of Guatemala. The history of the Province of Honduras during the Colonial period contains little of special interest, the Government of the country being entirely directed from Guatemala City, while the principal commercial center of all the Central American region was Granada, in the present Republic of Nicaragua.

In 1811 began the revolution that finally overthrew the Spanish Government of Guatemala, and September 15, 1821, an act of in-

dependence was formally proclaimed at Guatemala City, an example quickly followed by the other Provinces, Honduras included. In 1822, the whole of Central America was annexed to the Mexican Empire of Iturbide, but on his fall in 1823 the Central American states formed an independent federation with Guatemala City as the capital. Several years of internal dissensions followed, during which the great Honduran patriot, Francisco Morazán, became the most prominent man in Central America. Born at Tegucigalpa, in 1799, Morazán was a Senator of Honduras when a revolution broke out at Guatemala City in 1826 which threatened the overthrow of the new federation. At the head of a force of 2,000 men, he succeeded in capturing the federal capital and in 1830 was elected President of the Federation. A revolution in 1837, headed by Rafael Carrera and supported by most of the Indians of Guatemala, finally resulted in the overthrow of the federation and the defeat and exile of Morazán, who was executed in 1842 during a civil conflict in Costa Rica in which he was engaged. His last words were "Posterity will do me justice," and it is not too much to say that, in the judgment of posterity, he was the greatest statesman that Central America has yet produced. After the defeat of Morazán in 1838 the Federation of Central America split into five republics, of which Honduras was one—its Declaration of Independence being dated October 26, 1838. Several subsequent attempts were made to re-establish the Federation, Honduras usually taking sides with Salvador, Nicaragua with Costa Rica, and Guatemala standing alone in these conflicts. The history of the Republic has been, on the whole, devoid of any spectacular incidents, apart from occasional revolutions and small wars with neighboring republics. These have tended materially to retard the economic development of the country, but a more serious obstacle has been the lack of adequate transportation facilities between the Atlantic seaboard and the interior, Tegucigalpa being almost the last of the world's capital cities to be without railroad communication in any direction. This serious defect is about to be remedied by a new railway now in course of construction.

**COMMUNICATIONS.**—The only direct steamship line between New York and Honduras is that of the United Fruit Company, which dispatches steamers once a month for Puerto Cortés, calling en route at Belize, British Honduras, and Puerto Barrios, Guatemala. Recently these steamers have also called at Tela, Honduras. These vessels carry freight only, being chiefly engaged in the banana traffic. From New Orleans, the Independent Steamship Line (Vacaro Bros. & Co., Agents) has steamers every Thursday and Saturday for La Ceiba, calling at the Island of Roatán and at the port of Trujillo as freight offers, while the Atlantic Fruit Company has weekly sailings for Puerto Cortés. The United Fruit Company also has sailings from New Orleans every Thursday for Puerto Cortés, as well as weekly sailings for La Ceiba and Tela. The vessels of the Atlantic Fruit Company carry freight only, while the other two lines carry freight, passengers and mails. There are also three direct lines from Mobile, Ala.: The Orr-

routes above mentioned, usually via New York. This greatly increases the time required for European shipments, the British Consul at Tegucigalpa reporting that it takes some eight months for goods ordered in Great Britain to arrive, whereas orders placed in the United States can be filled in as many weeks. This gives a very substantial advantage to American manufacturers for all shipments to points on the Atlantic slope.

For Amapala, the only Honduran port on the Pacific, the Pacific Mail Steamship Company has direct sailings twice a month from San Francisco, and from Balboa (Panama) in the opposite direction. The Kosmos Line has sailings from San Francisco once a month and from Seattle about twice a month. The Merchants' Line (W. R. Grace & Co.) have sailings from the latter port to Central



Courtesy United Fruit Company.

A street scene at Ceiba. The business portion of this little city was recently destroyed by fire

and South America about twice a month. Through bills of lading to Amapala can be obtained at New York from the United Fruit Company, the Panama Railroad Steamship Line, the Hamburg-American Line (Atlas Service) and the Royal Mail Steam Packet Company, the route being via Colón, thence by rail to Panama and by steamer to Amapala. The American-Hawaiian Steamship Company gives through bills of lading via Puerto Mexico, thence by rail to Salina Cruz (Tehuantepec Route) and by steamer to Amapala. As the vessels of the Kosmos Line, after calling at leading ports in Central and South America (West Coast) proceed to Hamburg, Honduras has



Courtesy Pan-American Union.

A public square at San Pedro Sula, one of the leading distribution centers in the north

Laubenheimer Company Steamship Line, twice a month for various Central American ports, including Punta Gorda in Honduras; the United Fruit Company, which has weekly sailings for Puerto Cortés, Tela and La Ceiba; and the Hubbard-Zemurray S. S. Co., which has weekly sailings to the same ports. All three lines carry freight, passengers and mails. The Southern Pacific Company issues through bills of lading to all Atlantic ports in Honduras via New Orleans, where goods are transhipped to connecting steamers. There are no direct sailings between the Atlantic ports of Honduras and any part of Europe, so European merchandise must be shipped via one of the



Courtesy Pan-American Union.

The Cabildo at Comayagua, one of the oldest towns in Honduras and for a time the capital

one direct route to Europe on the Pacific side, while freight can readily be shipped on through bills of lading from any part of Europe via either Colón and the Panama Railroad, or any of the large West Coast ports of South America.

There is no railroad at present from the Pacific seaboard to the interior. Merchandise discharged at Amapala, which is situated on the Island of Tigre, in the Bay of Fonseca, being carried to San Lorenzo by sailing vessels and passengers by rowboats or motor boats (the latter being frequently out of commission). From San Lorenzo to Tegucigalpa, the capital, a distance of about 94 miles, a fine automobile and wagon road was built by the Govern-

ment quite a number of years ago. This was admirably graded, but washouts and landslides have rendered it impossible to use motor cars over it in recent years, and freight is usually carried by mule back and by means of ox carts. A proposition has been made to the Government by an American citizen residing temporarily at Tegucigalpa to keep this road in good repair for ten years, and establish a daily automobile and freight and passenger service over it, together with a service of gasoline launches between Amapala and San Lorenzo. It is reported that the road is now in course of reconstruction throughout.

On the Atlantic side there is a railway line owned by the Government of Honduras which runs from Puerto Cortés up the Valley of Sula to San Pedro, and thence as far inland as La Pimienta, a total distance of 56 miles. This railroad was first proposed by Mr. E. G. Squier, the

tract, extending as far as Masica, with a branch line to Salado. Messrs. P. Dutu & Cie, have a banana line some five miles in length at El Porvenir, in the Ceiba district. Other plantation railways are the Cuyamel Fruit Company's line, 12 miles in length; the Palmas Plantation Company, about five miles in length, and the Tela Fruit Company, about four miles. Concessions have been granted for a line from Puerto Sal, a short distance west from Tela, to the Laguna de los Micos; for a line running from Tela to El Progreso in the Sula Valley; for a timber railway from Omoa to the Chamelecón Valley; and for a line running inland about 18 miles from Nueva Arminia, a small port just east of La Ceiba, which will traverse rich banana lands and also tap a mahogany district. Altogether, the United Fruit Company has about 250 miles of banana railways in course of construction in the Tela district.

By far the most important railway projects now in course of realization in the Republic of Honduras are the Trujillo-Juticalpa line, with a branch from the latter city to Tegucigalpa, and the extension of the International Railways of Central America across Honduras from Salvador to Nicaragua. A preliminary survey of the first mentioned project was made in the spring of 1913, the proposed route crossing the River Aguán about 26 miles from Trujillo, then running up the valley of the Bonito River in the direction of Iriona, and thence to the Sico River, following that stream in the direction of Gualaco, and thence down the valley of the River Telica to Juticalpa. Under the original concession, the concessionaire has the right to construct either a standard steam or an electric railway, with branches on either side and an extension to Tegucigalpa. He also agreed to construct a wharf at the port of Trujillo, where the line starts. Work upon the first section, from Trujillo to the River Aguán, was to be commenced as soon as the Government gave its approval to the survey. Besides placing the capital in direct rail communication with the outside world, this line will serve to open up the important grazing and mining department of Olancho, which includes nearly one-fourth of the entire area of the republic.

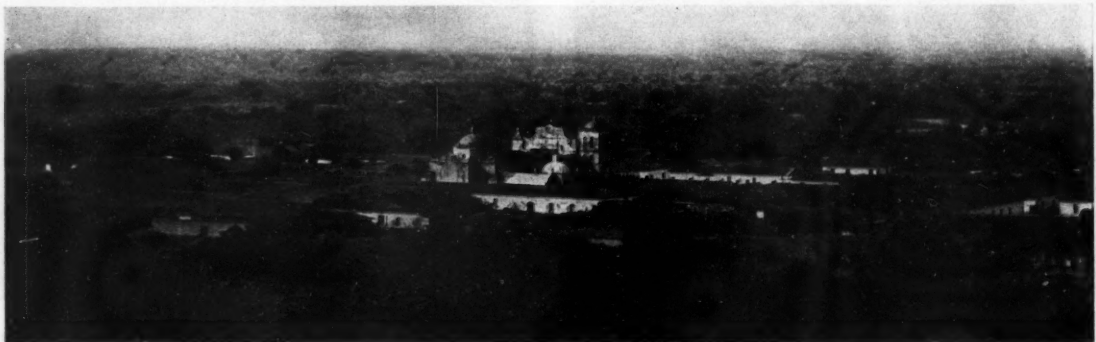
The other railway project will, if carried out, contribute materially to the development of the Pacific slope, but will be of considerably less economic importance than the line just mentioned. This is a concession granted to René Keilhauer, which is reported to have been transferred to the International Railways of Central America, and provides



Courtesy Pan-American Union.

Pier at Puerto Cortés. New piers are now being constructed at this important Caribbean port

diplomatic representative of the United States in Central America in 1850-1852. After much difficulty Mr. Squier succeeded in organizing a company of European capitalists to build a railway from Puerto Cortés to the capital, and then to Amapala, and surveys were made in 1857 and 1858. The Civil War in the United States, the Italian war in Europe, and the French invasion of Mexico combined to deter capitalists from investing in the enterprise and the concession obtained by Mr. Squier therefore became void. In 1868 an English syndicate took up the project and constructed the present line, but much of the capital was dissipated in various ways and construction work was eventually abandoned after completing less than a third of the



Courtesy Pan-American Union.

Comayaguela, a suburb of Tegucigalpa, showing the old Spanish Church and the tiled roofs of the single story houses

distance to the capital, leaving the Government under a heavy burden of debt from which it has not yet recovered. The road, however, is in operation as far as La Pimienta and carries a considerable traffic to San Pedro, which is the distributing center of this rich and fairly populous district. A contract has been made to construct a two-span steel railway bridge over the Ulúa River at a point just beyond La Pimienta, which will enable the Government to continue this line further inland toward Comayagua.

At La Ceiba, Messrs. Vaccaro Brothers have constructed some 57 miles of light railways through the banana dis-

trict, extending as far as Masica, with a branch line to Salado. Messrs. P. Dutu & Cie, have a banana line some five miles in length at El Porvenir, in the Ceiba district. Other plantation railways are the Cuyamel Fruit Company's line, 12 miles in length; the Palmas Plantation Company, about five miles in length, and the Tela Fruit Company, about four miles. Concessions have been granted for a line from Puerto Sal, a short distance west from Tela, to the Laguna de los Micos; for a line running from Tela to El Progreso in the Sula Valley; for a timber railway from Omoa to the Chamelecón Valley; and for a line running inland about 18 miles from Nueva Arminia, a small port just east of La Ceiba, which will traverse rich banana lands and also tap a mahogany district. Altogether, the United Fruit Company has about 250 miles of banana railways in course of construction in the Tela district.

(Continued on page 80.)



"Motorcycle Day" at Livermore, California

Courtesy United States Tire Company.

## THE MOTOR CYCLE OF TO-DAY

Electric Starting and Lighting System and the Two-Speed Gear  
the Most Striking Features—Two-Cylinder Models Increasing

**T**HE year 1913, during which considerable attention was paid to the perfecting of electric lighting, starting and ignition systems for the motor car, also saw the complete electrification of the motorcycle. At the New York Motor Car Show, which included 12 exhibits of motorcycles, a machine displayed by one of the largest manufacturers of motorcycles in America was equipped with an electric starter, electric head light and tail light, electric warning signal and two high-capacity storage batteries. Although regarded as thoroughly efficient and practical,

generator or dynamo and charges the batteries. Depending upon whether the machine is running on low or on high gear, a speed of 8 or 12 miles per hour must be reached before the charging operation will start. By means of an automatic regulator the charge to the batteries is controlled within safe limits when the machine travels at higher speeds.

Because of this ingenious combination of a motor-



Courtesy Harley-Davidson Motor Company.

Off for a camping trip on motorcycles—an ideal way to spend a vacation

the installation of the electric system was not achieved without difficulties, and experimental work extended over a long period. The motorcycle, in contrast to the automobile, is forced to undergo excessive vibration in proportion as its weight and speed increase. Innumerable attempts have been made to lessen this vibration by means of the most improved springs, and one of the striking characteristics of the electric system installed in motorcycles thus far is its ability to withstand jolts and jars.

A set of storage batteries is suspended securely in a casing beneath the saddle. Closing a switch leads the energy from this battery outfit to a small motor. This motor is coupled to the main shaft of the motorcycle engine and cranks it. As soon as the engine begins firing at good running speed, the motor automatically changes into a



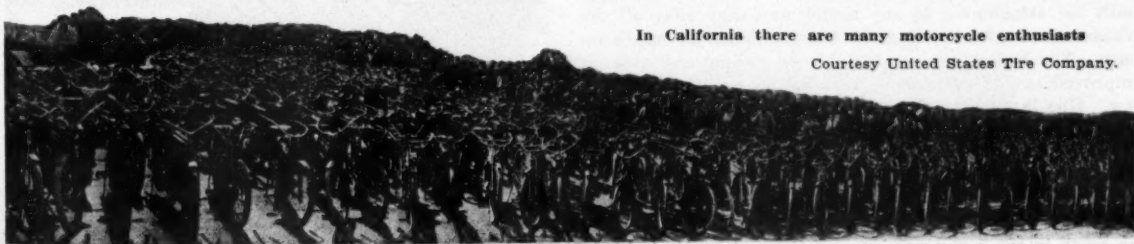
Courtesy Hendee Mfg. Co.

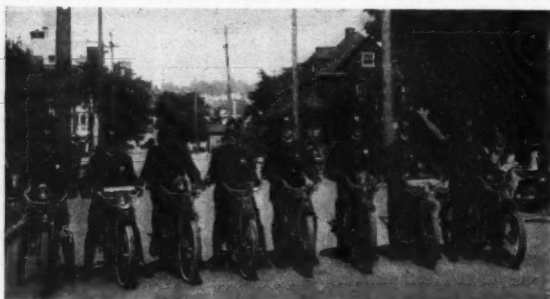
Frank Ward, 17 years old, who recently completed a 4,100-mile transcontinental trip on a motorcycle

dynamo there is always sufficient current, not only for starting the engine, but for lighting the lamps and for signal operation. And should the lights dim in service one of the storage batteries can be cut out, and the other used until the exhausted one has been recharged by the motor-generator. Fifteen hours of light can be secured, if the batteries are used intermittently, and 12½ hours when one is drained steadily. This means that approximately 750 miles of night riding could be traveled on each, if need be, with an illumination far more powerful, it is declared, than could be obtained with acetylene gas. Whether the lights are in use or not, the motor starter will fire the en-

In California there are many motorcycle enthusiasts

Courtesy United States Tire Company.





Courtesy United States Tire Company.

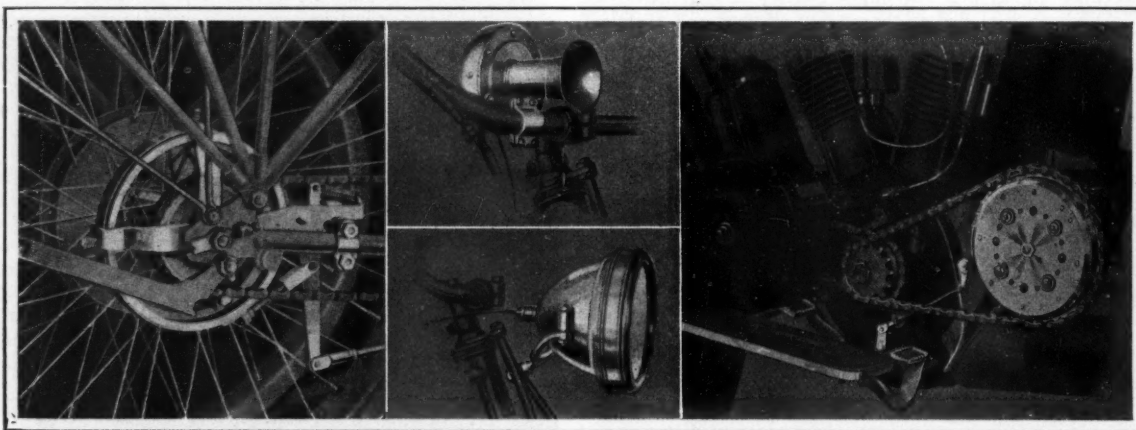
Motorcycle police squad at Portland, Oregon. Hundreds of cities employ motorcycles in this way

gine in from three to five seconds—in a cold condition from 12 to 15 seconds. The generator is constantly charging the batteries while the engine is running, and the possibility of the cells becoming exhausted under ordinary care is said to be very slight.

Aside from the installation of the electric system—the most striking of recent advances in motorcycle building—a notable tendency is the increasing use of two-speed gears. In congested traffic the two-speed gear permits a driver to throttle his machine to a walking pace, and then to secure

to result. The carrying of laundry, provisions and miscellaneous light loads was one of the very early uses to which it was put; but in the larger cities where it is necessary for the daily papers to be distributed over a great area in as little time as possible, the machines have been tested by publishers and are now considered almost as indispensable in distribution as linotype machines in composition. The present-day motorcycle will also enable repair men of gas, electric and telephone companies, as well as solicitors, collectors, contractors and salesmen, to accomplish from two to four times as much as can be done with a horse and rig. In the representation work of fire and accident insurance companies it frequently happens that the representative from the office must make speedy inspection of a fire loss or have an immediate conference with some injured person carrying a liability insurance policy. The motorcycle has been found to be the speediest machine for such work.

Clergymen have used the machines for missionary work, and one of the hardest, if not the very hardest, uses to which the machines have been put is that of path-finding for the publication of new road maps such as those used by automobile and other tourists. City building and park departments, and especially police departments everywhere, are now employing the machines with wonderful success. In the city of Chicago, 17 motorcycle policemen made 6,000 arrests in one year. In the city of Indianapolis, each of



Harley-Davidson band brake on belt model

Electric horn (above) and electric headlight on "Indian" motorcycle

Electric starter on Hendee Special Model Indian motorcycle

a quick "pick-up" of speed for weaving through gaps in vehicle jams. On sandy roads or steep climbs the device can give great power at a reduced speed—preferable to the action of a machine equipped with a single speed which, under similar conditions, is forced to attain a high speed in order to cover the ground, resulting in strains upon the motor. The most improved form of the two-speed arrangement is the selective, by which either a high or a low-gear speed can be obtained direct from a neutral position, without the one having to pass through the other.

Most of the new machines, especially those with two cylinders or with the two-speed gear attachment, are able to draw side loads with ease and over grades that a few years ago were considered too steep for the motorcycle alone. Partly as a result of this, the use of the motorcycle side-car has been gradually widened. The cars can be built for attachment to any model, and they offer all the pleasures of motorcycling to two persons, at minimum cost. The bodies are comfortable in design and ride on improved spring suspension, making for enjoyable traveling. One large manufacturing plant builds its own side-cars for exclusive use with its twin-cylinder models, but such cars can be bought separately from special builders and attached or detached in a short time, and without mechanical skill.

Because of its added power and efficiency greater progress in the commercial use of the motorcycle is likely

the motorcycle policemen is reported to cover an average of 50 miles per day, the up-keep of the machines averaging about 90 cents per month each. According to one manufacturer, no instance is known where any police department has abandoned motorcycles after a fair trial.

The youngest motorcyclist who ever crossed the United States from coast to coast—10 years old

Courtesy Hendee Mfg. Co.





Young olives in Tunis extending as far as the eye can see—intercropped with barley. In this region the annual rainfall averages only seven inches

## TUNIS TEACHES THE WORLD IN DRY FARMING

With a Rainfall of Only Seven Inches per Annum, Tunisian Farmers Conserve their Moisture by Planting Olives, which are Adjusted by Nature to an Arid Environment

*By J. Russell Smith, Ph.D., Professor of Industry, University of Pennsylvania*

IN some of the American States it has been said dry farming is pushing the desert off of the map. As a matter of fact, however, the American Desert has been holding its own pretty well of late, and there have been many localities in which dry farming has failed, and that, too, in regions where the rainfall has been from 14 to 18 inches per year on the average. Thus far there have been no hopes expressed by the American dry farming enthusiasts that there will ever be a profitable agriculture in regions of less than 10 inches of rainfall, and we have not been successful for any length of time in any locality with a rainfall that small.

With these limitations and failures in America, it is a matter of far more than casual interest to learn that Tunis has a prosperous dry farming agriculture in a region with a ten-year average rainfall of 7 inches, and this, too, accompanied by the blistering hot winds (Siroccos) that blow out of the nearby Sahara. The question at once arises—can those who live in other semi-arid regions hope to equal the success of Tunis? And the comforting answer is—yes, they can, if they will adopt the same devices.

Dry farming depends upon two things: first, conserving what little moisture there is; and second, using as crops those plants which are most economical in their water utilization. In both of these points, namely, an economical type of plant, and an efficient system for checking evaporation—the dust mulch—Tunis is ahead of anything to be found in the United States, or for that matter, in any other extensive dry farming region.

Tunis utilizes a new crop plant type, namely, the tree. The tree is ahead of the grains and grasses both in its efficiency as a catcher and utilizer of water, and it combines with this a superiority over all other types of plants in its adjustment to the dust mulch.

In the first place the tree has the great advantage of being a permanent institution. This point is very important when we consider the limitations of maize, wheat, or any other of the grains. They are plants of short life, and they have a regular cycle of growth which must proceed unchecked. They spend the greater part of their

time and energy in rearing a stalk that is of little use to man, and might be considered as the scaffolding around the real structure that is to be the finally completed grain. Then after some months of stalk or scaffold building, these plants must in a short time make their seed. If they do not at that particular time have conditions ready for seed-



Typical Arab olive trees, 70 years old, whose roots cover a much larger area than is overspread by their tops

making, the plant blasts and a crop failure results. It is well-known in the American corn (maize) belt that it is the rains of July that make corn crops. May rains are of little avail, nor are August rains more effective. Even June rains are often gone too soon. July rains make the crops. Small grains rush through their season of grain-forming. Moisture must be there at the critical moment or there is no grain forming.

In contrast to this, a tree, adjusted by nature to the arid environment, has great ability to hold moisture from the time it falls to the time it is wanted. Furthermore, it can equip itself wonderfully to get what moisture there is. The olive, the greatest crop tree of Tunis, is an admirable example of the tree's ability and its superiority to handle the water question. In regions of 20 inches of rainfall, where the water wets the ground to a considerable depth,

Vista of olive trees near Sfax, Tunis, where the plantations now cover several hundred thousand acres and are being steadily extended year by year





Mature olive trees 40 or 50 years old. Planted ten trees to the acre there is plenty of room for inter-cropping. Half way between the rows is a water barrier to stop loss of rainfall

the wild olive is a deep-rooter, sending its roots down for many feet to find and bring back the available water supply. Deep rooting, however, is of no avail in places where the rain is so slight that the water cannot go down very far before the process of evaporation again brings it to the surface and throws it off into the thirsty air. In such localities the olive is not a deep-rooter at all. Instead, it becomes wide-rooted, spreading its feeding rootlets over a wide area close to the surface, thus being in a position to grasp every shower and even a heavy dew as soon as it falls.

Mr. Silas C. Mason, of the United States Department of Agriculture, has recently reported some very interesting concrete facts along this line, which make an admirable scientific vindication of the practices worked out long ago by the Arabs of Tunis. Fourteen years ago some American farmers abandoned certain olive plantations in the San Bernardino Desert of California, and in certain arid localities of Arizona. In the San Bernardino Desert, especially, the trees have given a performance which is little short of marvelous. They have lived and grown for years with an average rainfall of 3 inches, and actually survived through twenty months, including two desert summers, with a rainfall of .70 of an inch. Careful examination of these trees shows that their roots cover an area nine times as large as that overspread by their tops. Furthermore, the total root mass is much larger than the top, and serves as a veritable storehouse of energy, plant food, and moisture. These the tree, through hundreds and thousands of years of combat with the desert, has learned to conserve by developing an almost watertight leaf, glazed above and covered with fine hairs beneath. Being an ever-green, this tree is always on the job to grasp the water when it rains. When the time comes for blossoming and fruiting, it blossoms and makes a crop. The French farmers and the Arab farmers alike are agreed in Tunis that there is no comparison whatever in regularity between the small grains and the olive. Over a period of years, even barley, our best desert grain, will fail nearly twice as often as the olive. The good water-storing ability of the olive is well shown by the fact that the olive crop of one year responds very closely to the rainfall of the year before.

So much for the explanation. The facts are that Tunisians have one of the greatest horticultural boons in the world. One can ride outside of Sfax for twenty, thirty, or forty miles, and be almost continuously in olive orchards, unless perchance he runs out into the desert and sees the camel pasturing on the scanty bush that has not yet been subjected to the dry farmers' civilizing processes. The theory explained above was hit upon by the Arabs long ago, for they had worked out dry farming to its present perfection as early as 1840, and there is good reason to suspect that they were putting into operation practices followed by the Romans fifteen hundred years before in the same locality. Their success was such that when the French got possession in 1881, they began to copy the Arab's method without any variation whatever except some superiority of tools. The increased political stability that followed the French police control has permitted the French and Arabs alike to plant extensively, and the practically continuous planting now includes several hundred thousand acres, and is still going on. Just how far the orchards will go it is difficult to foresee, for the olive is rising in price, and the trees are succeeding in Tunis where there is an average rainfall of 7 inches, and a period of seven years in which the rainfall was a little over 5 inches did not so much as check the speed of the plantings.

Their actual method of making an orchard is as follows: They plant a truncheon, or big root, cut from a bearing tree, and water it two or three times a season for the first two or three summers. Owing to the fact that the tree sends its roots such great distances, and can utilize all the water there is, the Tunisians have long ago discovered that from 7 to 10 trees an acre can utilize all the water there is, and make as many olives as would 50 trees, for which there is plenty of room on the same superficial area. This results, therefore, in their planting the trees about 70 feet apart. In the young orchard the mid-spaces for six or seven years are planted to barley or wheat. After that they practice almost religiously a most thorough kind of clean culture to keep the dust mulch.

They have found, moreover, that this continuous dust mulch for sixty or seventy years so exhausts the soil that the olive starves to death, after which they plant almonds. There is no reason, however, why quick-growing winter

At the left a native Arab cultivating the variety of olives that the Romans left with a typical native plow; at the right an American spading harrow, an excellent implement for dry farming

Courtesy Wiard Plow Co.



legumes such as crimson clover, French beans, and others (of which there are many) might not occasionally be grown for a short time and plowed under to maintain the humus and fertility supply. Experiments in this direction are being undertaken in Tunis.

The writer wishes to emphasize the great superiority of the tree over any other kind of crop in its adjustment to the conditions of dry farming. It is impossible to maintain a perfect dust mulch under wheat because the wheat cannot be cultivated with any ease. The result is that our best dry farming practice consists in doing the dry farming one year, and getting the crop the next. During the year the wheat covers the ground ordinary processes of water waste through successive evaporation from the earth's surface continue unmitigated. The Chinese have met this by putting the wheat in rows and cultivating it with animals as we do corn. This is laborious, and for Americans too costly, because of the small unit of work that can be done by a cultivator. But notice the perfection of the olive tree. It covers possibly a square foot with its trunk. The rest of the surface can at any and all times be cultivated by the most widely reaching kind of motor-drawn, or an animal-drawn harrow, cultivator, etc. The dust mulch can reach its absolute perfection.

In addition to the above perfection of dry farming, the Tunisians have developed another practice well worthy of imitation elsewhere; namely, the raising of ridges along the face of the gentle slopes so that it is impossible for water to run away from the place where it falls. Thus there is no loss of water whatever through run-off. The perfect dust mulch can be maintained to keep the water after they have made it go into the ground, and the most efficient of all types of plants—the tree—is utilized to turn this water into crops. The teaching for dry farming regions is plain. Farmers in such localities must introduce from Europe such tree crops as fit the conditions of aridity, and develop others in this class. The writer would especially call attention to the mesquite and honey locust. Both of these trees now grow wild over the arid territory of southwestern United States and northern Mexico, and produce long beans with a high food analysis. They are much prized by all domestic animals as a substitute for the expensive meal and bran which farmers are now buying with such increasing difficulty. The olive, of course, is capable of growth over large areas in these regions.

There is little doubt that the full application of the lesson taught by the tree-croppers of Tunis will give the human race the effective means of realizing the highest hopes that the dreamers have ever had for the dry farming conquest of arid lands.

## RECLAIMING A PROVINCE FROM THE SEA

Proposal by Holland to Form a New Province by Draining the Shallow Zuider Zee

**T**HE first step in what is undoubtedly one of the most ambitious projects ever undertaken by any country was taken when Queen Wilhelmina, in her speech from the throne on September 26, announced that a bill would be introduced into Parliament proposing the drainage of the Zuider Zee and the formation of a new Dutch Province. The area which it is proposed to enclose with a massive dyke built of concrete blocks comprises some 1,372 square miles, but as a considerable portion of this lies under water of considerable depth, the total amount of land reclaimed will amount to only 815 square miles, the remainder being left to be gradually transformed into a fresh water lake 557 square miles in extent by receiving the water from the River IJssel, a branch of the Rhine.

Reference to the accompanying map shows that the dyke will extend from Ewijksluis across the Amstel channel to the corner of the island of Wieringen, and then from the other side of the island to Prieaam, in Friesland, a total distance of 18.3 miles. The depth of water in which this giant embankment or dyke will be built averages 11 feet 9 inches at low tide, except for a short distance in the

Amstel channel, where it amounts to 33 feet. It will be built to a height of 17 feet 9 inches above the average high water mark, and it is expected that nine years will be required to complete the work. Locks will be provided for the sea traffic to and from the lake, and sluice gates at intervals for regulating the depth of the water inside the embankment.

Aside from the fresh water lake, it is proposed to form four reclaimed areas, to be known as the Northwestern, the Southwestern, the Southeastern and the Northeastern polders, with areas, respectively, of 53,599, 77,855, 266,167 and 125,599 acres, of which 11,436 will be taken up by canals, dykes and roads. It is estimated that some of these reclaimed lands will be ready for occupation and cultivation about 17 years after the beginning of the construction of the great embankment, and the State will then divide them into plots and offer them for sale on such terms and in such amounts as will not tend to depress the prevailing value of other realty. The new province, it is thought, will provide homes and farms for 40,000 people.

In addition to the benefits to be derived from the reclaimed land, of even more importance to Holland, is the formation of a large fresh water lake, as that country,



Sketch map showing proposed new lands to be reclaimed by draining the Zuider Zee

during the summer, suffers from an inadequate supply of fresh water.

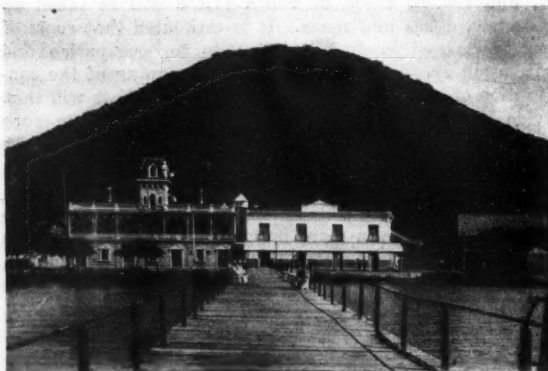
As there are at present some 3,017 fishermen who find their livelihood in the Zuider Zee, catching flounders, herrings, anchovies, smelts, eels and shrimps to the value of over \$800,000 per annum, whose tackle and boats will become useless with the erection of the embankment, the government proposes to recompense them by providing new boats, etc., suitable for working in the North Sea.

The cost of erecting the embankment and of the other work connected with the project is placed at about \$75,000,000, exclusive of interest, and the time required for the completion of the entire work 33 years. The embankment, itself, will involve an outlay of some \$15,000,000, and the forts to defend the locks and sluices about \$4,000,000 additional. Of course, no actual reclaiming can be done until the completion of the embankment, but when it is finished dykes will be built around the areas to be reclaimed and the water pumped out of them into the lake. This work will cost approximately \$50,000,000, and the balance will probably be required for incidental expenses not now foreseen. According to the scheme, as at present outlined, it is expected that the dykes for the northwestern area will be started eight years after the work on the embankment has begun, those on the southeastern after 11 years, those on the southwestern in 21, and those of the northeastern in 25 years.

## THE REPUBLIC OF HONDURAS

(Continued from page 74.)

make it possible to go by rail from the United States to Honduras by the end of 1916, provided the Salvador portion of the line from the City of San Salvador to San Miguel—which is now in course of construction—has been completed. A concession has recently been granted to an American citizen for the navigation of Lake Yojoa, the largest lake in the Republic, by means of a 100-horsepower



Courtesy Pan-American Union.

The wharf and custom house at Amapala, the only port of Honduras on the Pacific side

steel vessel, 75 feet long by 12 feet beam. The concessionaire has constructed a wagon road from La Pimienta to the lake, the southern shore of which is about half way from Puerto Cortés to the important town of Comayagua.

**DEPARTMENTS AND PRINCIPAL PLACES.**—The Republic of Honduras is divided for administrative purposes into 16 Departments and one Territorial district. A list of these, together with the capital of each, follows:

Department.	Capital.	Department.	Capital.
Tegucigalpa	Tegucigalpa	Comayagua	Comayagua
Choluteca	Choluteca	Copan	Santa Rosa
El Paraiso	Yuscaran	Gracias	Gracias
Olancho	Juticalpa	Intibuca	La Esperanza
Cortés	San Pedro	Valle	Nacaome
Colon	Trujillo	La Paz	La Paz
Yoro	Yoro	Santa Barbara	Santa Barbara
Atlantida	Celba	Bay Islands	Raután
		Territory of Mosquitia	

**TEGUCIGALPA.**—Founded in 1579, the capital of the Republic is a picturesque city situated on the tableland of the interior at an elevation of about 3,000 feet above the level of the sea. The name is taken from Indian words meaning "Silver Hill." Morazan Park, the principal square in the city, contains a fine equestrian statue in bronze of the famous liberator, who was a native of this city. Facing the plaza are the Cathedral, the Cabildo, and the national library. The city has a telephone system, waterworks and electric lighting system. The National Bank of Honduras is located here, and most of the leading merchants of the country have their head offices at the capital, so American, English and German traveling salesmen find it worth while to make the trip inland from Amapala. When the railroad from Trujillo to Juticalpa has been extended to Tegucigalpa, the commercial importance of the city will undoubtedly be materially increased, and it is also probable that the bulk of its trade will then be carried over the Atlantic route instead of by the Pacific port of Amapala, as at present.

**TELA.**—In the fertile lowlands between Puerto Cortés and La Celba, along the banks of the Colorado River, the Micos Lagoon and the alluvial flats along the Uda River, the United Fruit Company is developing an important banana raising district. Tela, on account of its excellent harbor, is the natural port for this region and has been selected as the company's administrative center. Here the company is erecting houses, shops and stores and has established a Medical Department, with one of the best equipped hospitals in the tropics. More than 250 miles of banana railroads are in course of construction and the planting of 50,000 acres of bananas is well under way. The present population of the town is about 1,000, and of the surrounding district 2,500. Beginning early in 1914 the United Fruit Co. made Tela a port of call for its New York boats, as well as for those from New Orleans.

**LA CEIBA.**—This port, which is situated on the North Coast, about midway between Puerto Cortés and Trujillo, was established about 27 years ago. It is now the center of a very large and highly developed banana district, with an extensive network of railways radiating westward along the coast and toward the interior, in the direction of Yoro. March 9, 1914, the entire business section of the city was destroyed in the most disastrous fire in the history of the country. Altogether a total of 19 blocks were burned,

including most of the city's mercantile establishments and office buildings and about 100 residences. It is likely, however, that the city will be at once rebuilt, and in a much more substantial manner. At the time of the fire it had well-paved streets, waterworks and an electric lighting system.

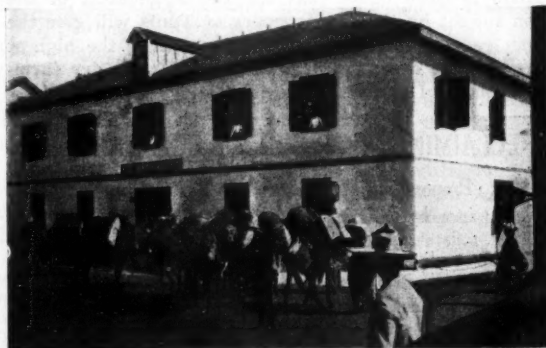
**TRUJILLO.**—Situated close to the first landing place of Columbus in Honduras, Trujillo has again become known in recent years as one of the most important banana shipping ports on the North Coast. The concession for the railway from Trujillo to Juticalpa provides for the construction of a wharf at Trujillo Bay. The new wharf will be situated about five miles from Trujillo, or ten miles following the contour of the coast, and a branch railway will be constructed from the wharf to the city proper. The town has a salubrious climate, an excellent water supply system, and when the new railway is in operation as far as Juticalpa, will undoubtedly be one of the most important ports in the country. Its present population is less than 2,000.

**PUERTO HERRERA (Territory of Mosquitia).**—The Government of Honduras has been planning to establish a free port under the name of Puerto Herrera on the eastern bay of the large Caratasca Lagoon, with a view to opening up to exploitation the vast banana lands and interior forests of this region, which was returned to Honduras by Great Britain under the treaty of 1857. It has been estimated that this territory contains 90,000,000 pine trees, 45,000,000 mahogany trees and about 14,000,000 other trees of various kinds. The region is well watered, the large Patuca River flowing through it, and gold is found in many of the smaller rivers and creeks. The mountains of Colón, in the highlands of this region, have never been explored.

**AMAPALA.**—The only port of the Republic on the Pacific side is Amapala, situated on the Island of Tigre, in the Bay of Fonseca. It is a small town of some 3,000 inhabitants, but as the climate here is very hot, travelers usually leave for Tegucigalpa as soon as possible. While the harbor is deep and safe—in fact one of the best on the entire Pacific Coast—the piers are at present too small for ships to discharge alongside, so merchandise is transferred into lighters, in which it is taken to San Lorenzo on the mainland. Passengers usually make the trip in motor boats.

**NACAOME.**—The capital of the Department of Valle, the smallest in the Republic, in the lowlands back of the Bay of Fonseca, the commercial importance of this town will be greatly increased if the line of the International Railways of Central America from Salvador across the Republic of Nicaragua is built through it. The town was formerly much more important than at present, its port, La Brea, having been abandoned for San Lorenzo, as launches could only land cargoes at high tide. The population at the last Census was 8,152.

**SAN PEDRO SULA.**—After the capital, San Pedro is the largest inland distributing center in the country. It is situated on the National Railway, about 37 miles from Puerto Cortés, in the fertile and populous Sula Valley. There is a branch of the National Bank of Honduras at San Pedro and a number of mercantile establishments. Quite a few Americans and Europeans owning haciendas or mining property in the Republic reside at San Pedro or in its vicinity. San Pedro is the capital of the Department of Cortés and has a population of 7,820.



Courtesy United Fruit Company.

Train of pack mules loaded with merchandise for transportation over mountain trails to the interior

**PUERTO CORTÉS.**—The terminus of the National Railway and the port nearest to the United States of any in Honduras, Puerto Cortés at present ranks second in imports and first in exports. The harbor is large and safe and the lowlands around the town are gradually being filled up in order to do away with the danger of yellow fever. The population is about 2,500.

**OTHER TOWNS.**—The principal towns and large villages not previously mentioned are GRACIAS (founded in 1536) and SANTA BARBARA, capitals of the two Western Departments of the same name; YUSCARAN, capital of the Department of Paraiso in the southwestern part of the Republic; SAN JUANCITO, in the Department of Tegucigalpa, not far from the capital, the principal mining town in the country; SULACO, a town in the Department of Yoro about one-third of the way from that city to Comayagua; and ROATAN or COXIN HOLE, a banana port on the Island of Roatan, and capital of the Department of the Bay Islands.

## THE SAN DIEGO EXPOSITION, 1915

**A**N international exposition is being built at San Diego, California, to celebrate the opening of the Panama Canal and, incidentally, to direct the attention of the world to the commercial possibilities of the Pacific Coast of the United States. The exposition will last throughout the entire calendar year, opening January 1 and closing Dec. 31, 1915. Its promoters state that \$10,000,000 will be expended in preparing the exposition grounds and erecting the group of beautiful buildings shown in the accompanying bird's eye view.

The city of San Diego is situated in the extreme southwestern part of California, directly on the shore of a great harbor, and will be the first Pacific port of call in the United States for vessels coming up the coast from Panama. The citizens of San Diego believe that their port will therefore become of ten-fold more importance as a result of the completion of the canal and that most, if not all, of the great steamers coming from Europe and the eastern part of the United States to the Pacific Coast ports of the United

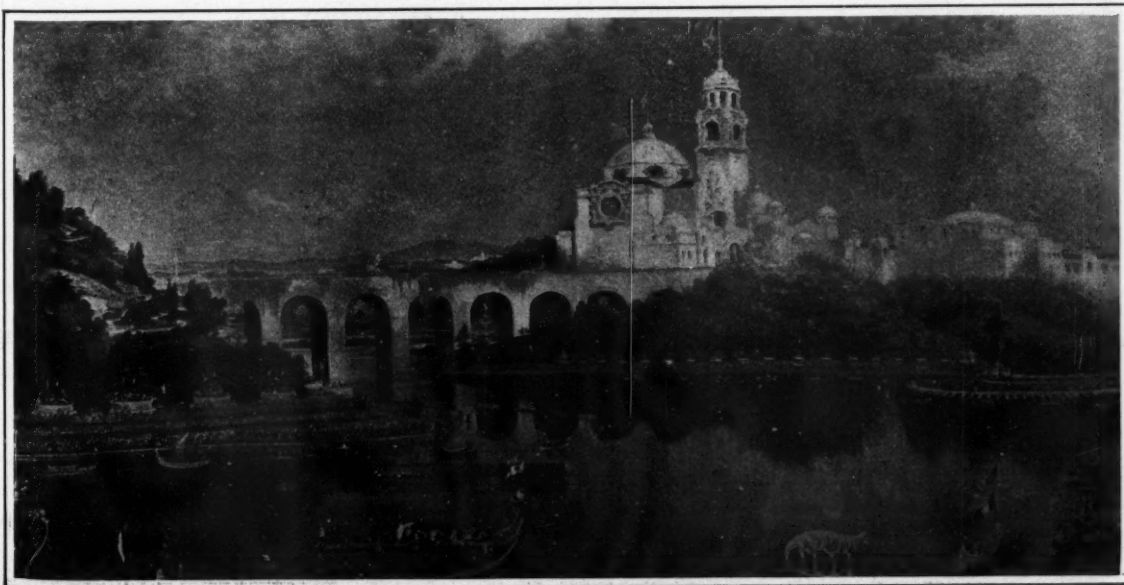
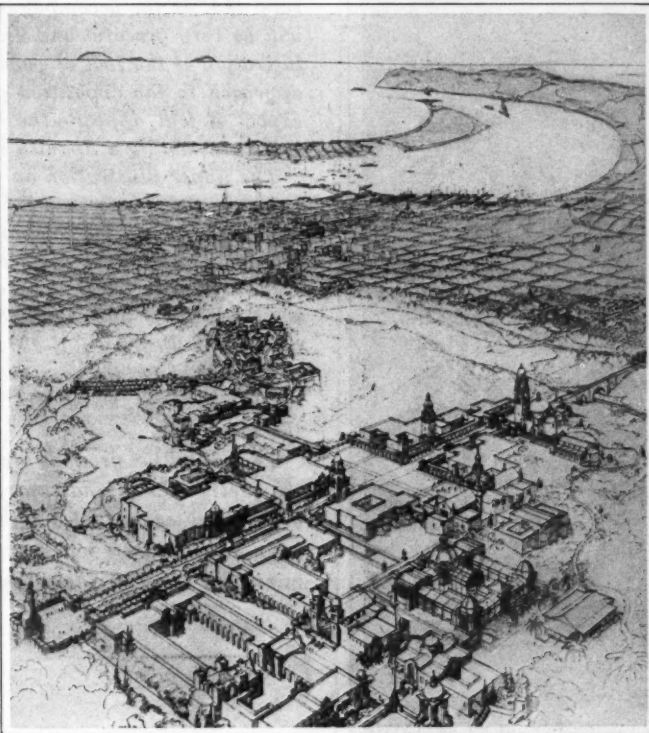
States and Canada will find it to their advantage to stop here. In anticipation of this increased traffic, the port has been greatly improved and wharves constructed so that the largest steamers can discharge and take on passengers and freight directly alongside.

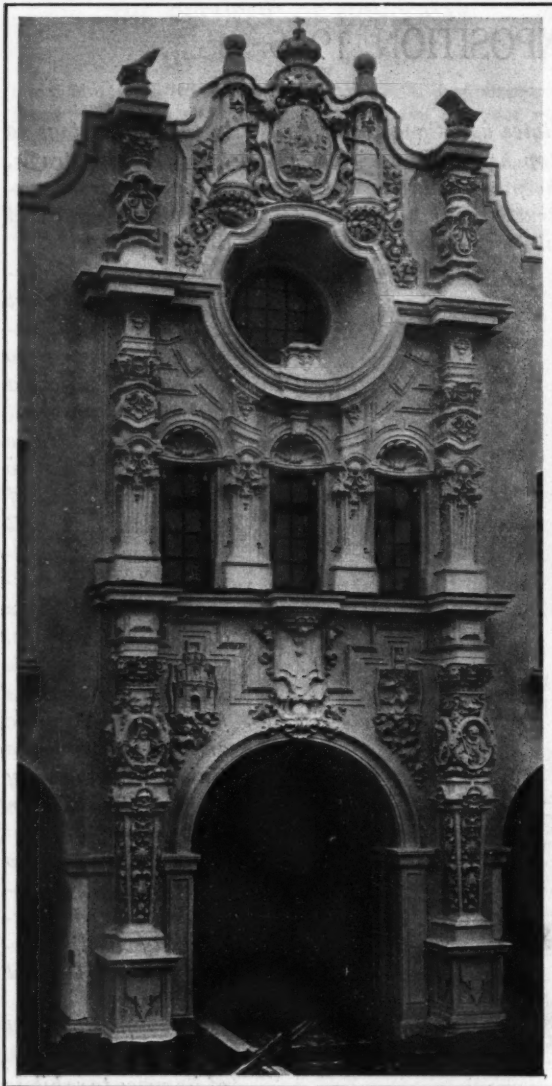
The enterprising people of San Diego also feel confident that this port

will become an important gateway to Southern California for the immigrant and tourist traffic which is certain to develop as a result of the canal, and will also be a distributing center for merchandise of all kinds coming from Europe, Central and South America, as well as from the Atlantic and Gulf ports of the United States. They also hope to make San Diego a port of shipment for exports to all parts of Latin-America, and particularly to the Republics of Central America.

The exposition will therefore devote much of its space to exhibits

showing the progress, products and requirements of the Latin-American Republics. Work on the exposition grounds was begun in 1911 and in the early part

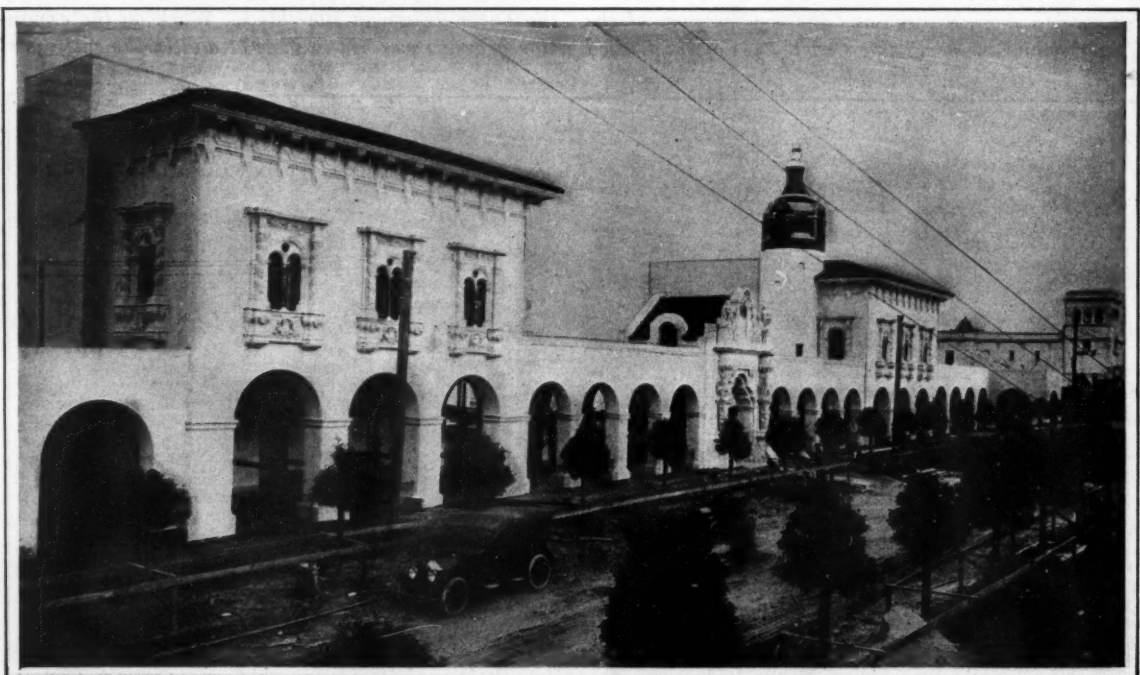




of 1913 the construction of the various exhibition palaces was commenced. It is expected that these will all be complete and ready for the installation of exhibits early in the present year. The buildings are of the Spanish-Colonial type of architecture and, as the accompanying illustrations show, will be very graceful and beautiful. The lower illustration at the foot of page 81 shows the western approach to the exposition grounds as the artists expect it will appear—the buildings from a distance resembling a Spanish medieval city.

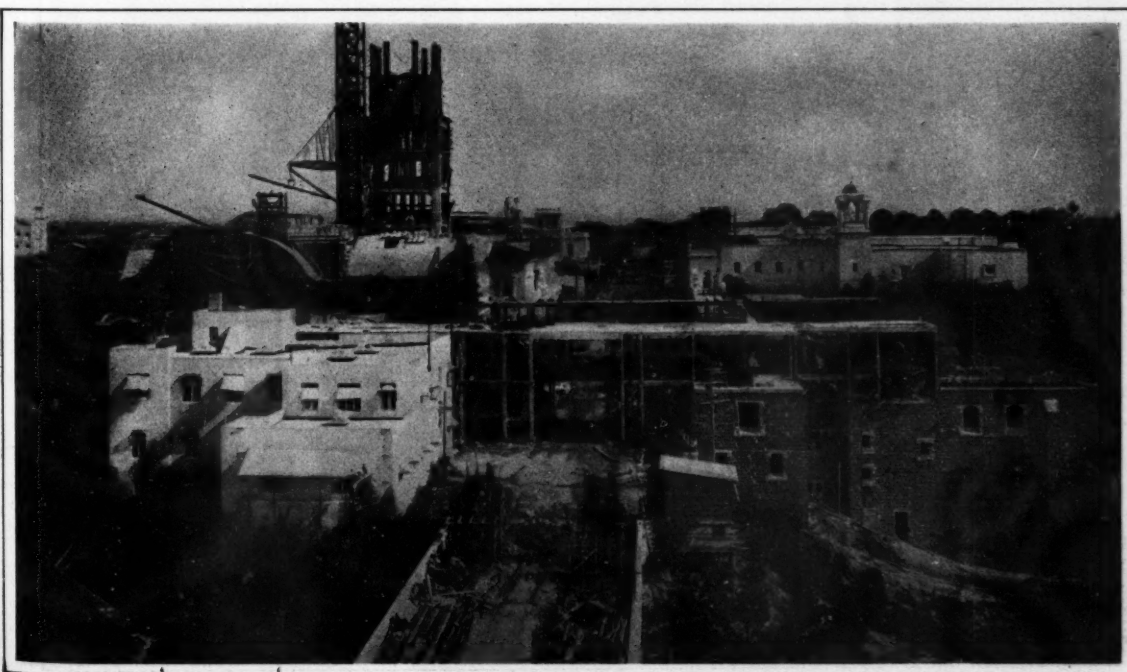
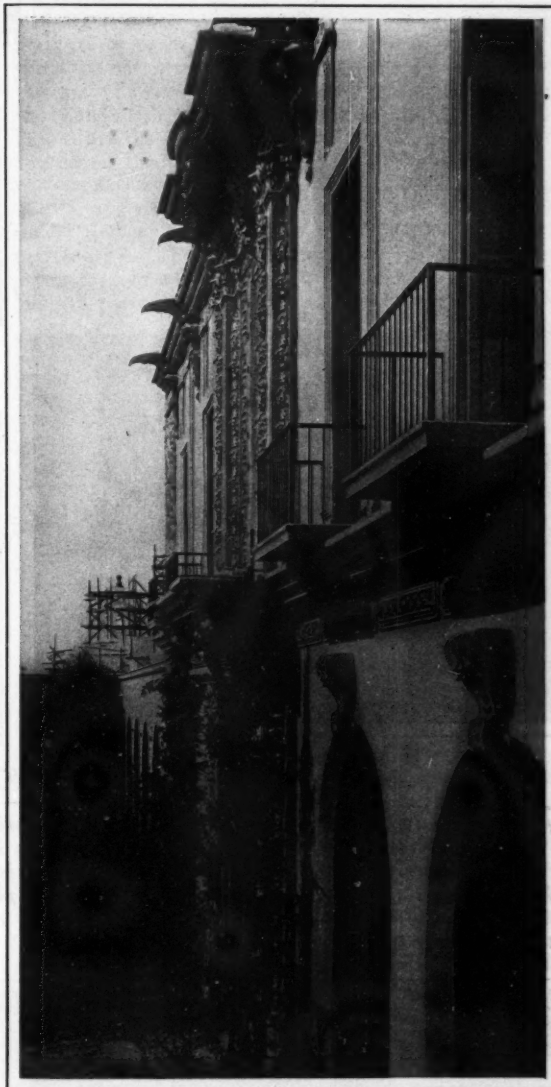
The upper illustration on page 82 shows the entrance to the Science and Education Building, as it now appears, and the companion picture at the top of page 83 shows the front of the Home Economy Building. The lower view on page 82 shows the same buildings and a number of others nearing completion February 1, 1914, and the lower view on page 83 shows the construction work on the main exposition street, which will be called El Prado, on the same date.

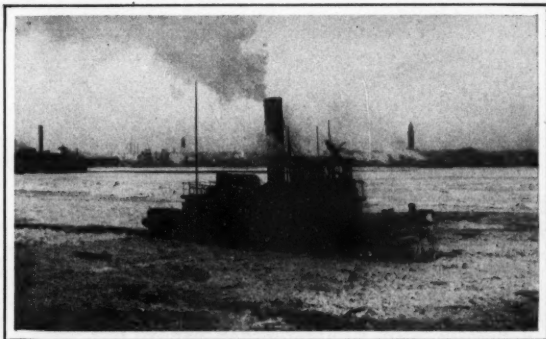
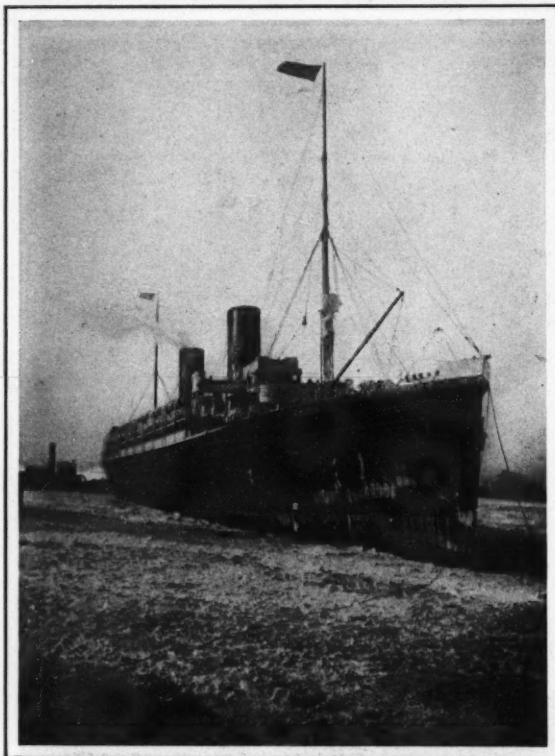
The exposition grounds are high and sightly, and the gently rolling landscape is traversed by a number of small canons filled with tropical verdure, and terraced from their tops down to the borders of the miniature lakes at their bases. Huge palm trees



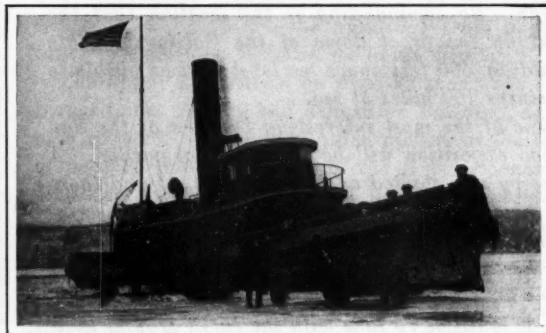
will be everywhere in evidence, and the hillsides will be covered with innumerable tropical trees, plants and shrubs. When the exposition is over all this work on the grounds will be preserved by transforming them into a permanent public park for San Diego, to be known as Balboa Park. The site is 300 feet above sea level and commands a view of the city, Point Loma, San Diego Bay, and the Pacific Ocean. So commanding is the location that the light on the great dome of the California State Building, 500 feet above sea level, will be visible to mariners 100 miles at sea.

One of the most interesting features of the San Diego exposition will be the botanical garden. A nursery was started as far back as 1911 and there are now many thousands of plants of all descriptions ready to be set out in the botanical garden or on the exposition grounds. Over 3,000 palm trees alone have been transplanted, some of them weighing as much as 70 tons with the earth around their roots. The counties of Southern California have planted in one exhibit 700 of the finest citrus trees that could be found. Adjoining these is a deciduous grove, and beyond this are garden and berry vines intended to show all of the economic plants of the region in which the exposition is located.



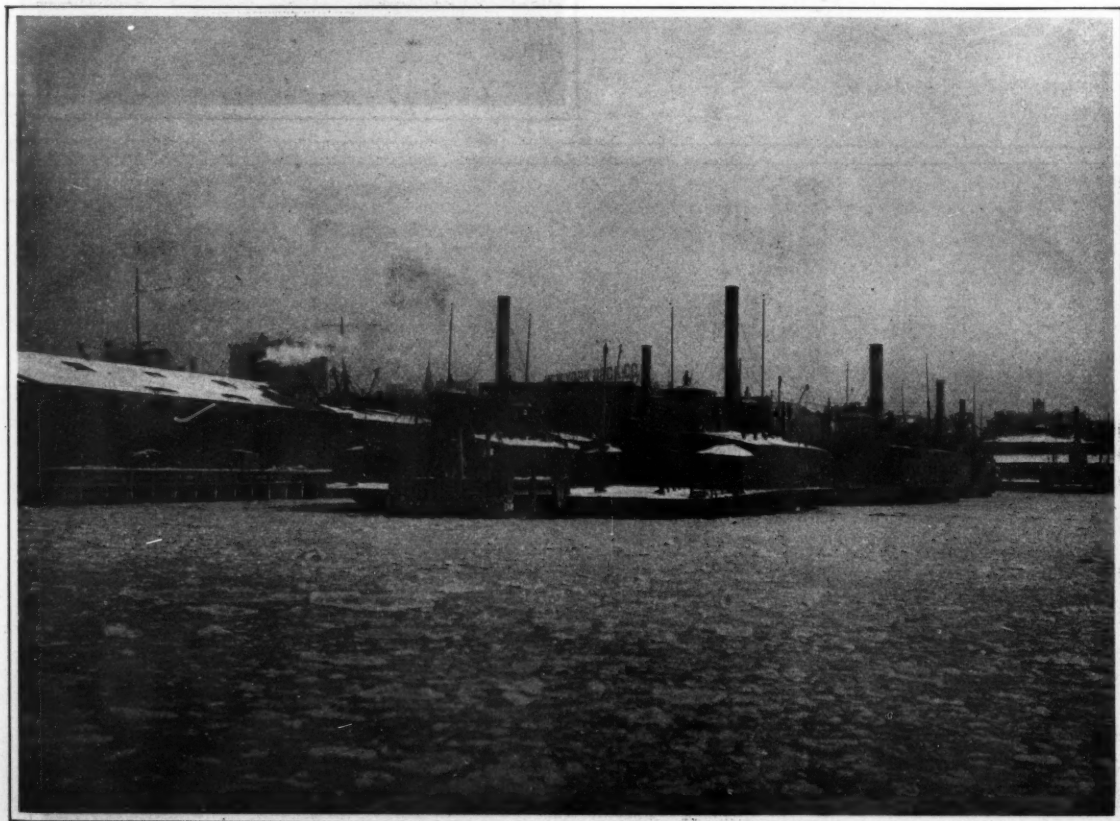


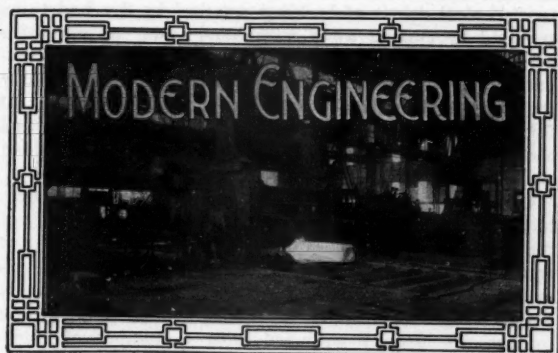
Photos by Edwin Levick.



#### ICE IN NEW YORK HARBOR

**F**OR a few days during winters of exceptional severity large quantities of drift ice are brought down the Hudson River and, for a time, impede navigation somewhat in all parts of the harbor. The great ocean liners experience little difficulty in plowing through this ice, but it frequently gives trouble to smaller vessels, such as ferryboats and tugs. The tug boat shown completely frozen up in one of the small illustrations had ventured a considerable distance up the Hudson, which often freezes clear across as far down as Tarrytown, some twenty miles north of New York City.





## WELDING BY OXY-ACETYLENE PROCESS

A Rapid and Efficient Method of Welding and Cutting Metals that is Proving Very Popular

IT is only a few years ago that the oxy-acetylene process made its appearance among the agencies of modern industrial progress. To-day it may be said without danger of exaggeration that a revolution in its and welding of

The process is the long series of experiments that have been conducted in an the tremendous sary in the work of Ordinary fuel yields

it has brought about field — the cutting metals. culmination of a periments that have attempt to produce temperatures neces-repairing machinery. only about 3,000 de-



Welding a broken lamp-post by the oxy-acetylene process

grees F. The initial step was to try coal-gas burned in air; but the result, while an improvement on the time-honored method, was scarcely satisfactory. Then hydrogen was substituted for coal gas, and pure oxygen (the vital element in all combustion) was used instead of air. This brought up the resulting temperature to 3,800 degrees. Here was indeed an improvement, but it was not until it was learned that a highly energized gas could be generated from calcium carbide that the goal aimed at was attained. This gas is what is now known as acetylene, and when burned in a jet of pure oxygen produces the tremendous heat sufficient to cut or weld any metal.

The oxy-acetylene process produces the incredible tem-

Readers interested in any of the articles here described may obtain SERVICE DEPARTMENT, DUN'S REVIEW, catalogues and prices by addressing 290 Broadway, New York, U. S. A.

perature of 6,000 degrees F. The apparatus consists of the acetylene generator, a tank of oxygen gas, connecting rubber tubes, pressure gauges and regulators, and the hand-torch with its detachable tip, which is the direct tool by which the work is carried on. Having turned on the acetylene, the operator lights the gas in the usual way at the tip. If he is about to make a cut, he applies the flame to the area until it is at a red heat. He then opens the flow of oxygen, and is ready to set to work. The oxygen enters the center of the flame in the form of a fine jet, and by forcing away the surrounding air, leaves for itself a free field to combine with the



Cutting twisted steel girders after a fire by means of an oxy-acetylene torch

acetylene. In cutting processes, however, the action of the oxygen does not consist merely in raising the temperature of the flame; it assists directly in wearing away the metal and thus in making the incision. It is well known that iron as well as other metals have a great tendency to combine with oxygen at high temperatures, and that is the important principle in the process. As soon as the metal is heated it begins to form an oxide. The rapid work of the flame carries away the oxide in a continuous stream and leaves no time for the flame to injure the adjoining areas. The apparatus works as neatly as a pyrograph point does on wood, and the cut is clean and smooth.

In welding, the process depends entirely on the action of the powerful the union of the the oxygen gas. sists in fusing together from the joint upward, the welding rod a same material as being repaired. weld is neat and object is as strong at that point as if it had never been broken. The filler readily

heat produced by acetylene and The method con-the metal to-bottom of the and in using as "filler" of the the object that is Invariably the even, and the

Preparing the fractured ends preliminary to welding



yields to the heat and liquifies under the action of the flame, and as the parts are brought together the contact results in a complete union. That the metal point and torch do not themselves yield to the tremendous temperature is due to the simple fact that the center of a



A stump-puller casting so badly broken that its repair seemed hopeless to the owner

burner-flame is very considerably colder than its outer film.

One of the most important uses to which the oxy-acetylene process is applied is in the repairing of broken machine parts. Expensive castings, that have become broken through accident, can now be rapidly, efficiently and economically repaired by this process; the finished job usually being the equal of a new casting in every respect. Not only castings, but complicated machined parts, such as cylinders, frames, pistons, piston rods, crank shafts, valves and many other pieces of an engine or machine can also be readily repaired, when fractured, by means of the oxy-acetylene process, thereby saving the expense of having a new part made over again as well as the long delay. The



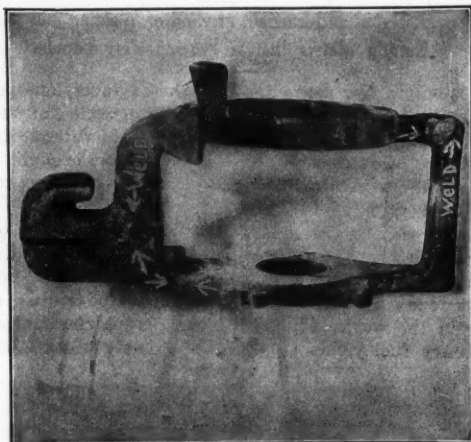
The work of restoration partially completed, the acetylene torch making one of the final welds

welded joint is as strong as the rest of the repaired piece, the tremendous heat of the flame causing the broken parts to become united together into one mass. Aside from the repairing of broken machine parts, the oxy-acetylene process is also useful for welding boilers, tubes, tanks, etc., and for reclaiming defective castings. It is widely employed by machine shops, manufacturing plants, railroads, foundries, wreckers and contractors.

Not alone in the matter of welding does the oxy-acetylene process prove popular, but it is also largely used today for the cutting of steel—the thin flame of the torch cutting its way rapidly through plates, beams or other shapes of steel with the greatest ease. Time was when the

twisted steel debris of building wrecked by fire had to be removed by cutting away with hand saws—an operation which consumed a very long time and proved highly expensive because of the amount of labor required. To-day the oxy-acetylene flame rapidly cuts its way through all forms of steel and not only greatly reduces the time and the amount of labor required, but simplifies the task of clearing the ground of the debris in many ways.

Oxy-acetylene plants are built in many styles and sizes to suit varying requirements. The generator is usually of the simplest design, devoid of complicated parts and equipped with a feeding device that insures positive action and a uniform supply of acetylene gas. The oxygen is supplied by reservoir tanks. The welding and cutting torches are usually equipped with a number of interchangeable tips for different kinds of work. Complete outfits consist of the acetylene generator, oxygen tanks, torch



Casting restored to its original form and strength, the principal welds indicated by arrows

and connecting hose, acetylene and oxygen pressure gauges and regulators, assorted torch tips for different classes of work, welding goggles, rods and flux. The entire equipment is mounted on a four-wheeled truck so that it may be readily transported to any place desired.

#### A PORTABLE SAW RIG FOR BUILDERS

ONE of the handiest labor-saving machines for the use of carpenters, builders and contractors that has appeared on the market for some time is a compact little portable saw rig, the power for operating which is supplied by a 3-horsepower gasoline engine, built in and forming a part of the general construction. With this machine a carpenter can rip 3-inch lumber, joint 4-inch stuff, plane, plow and bore window frames, do shaping, rabbeting, tenoning and sanding, grinding or crosscut sawing almost as well as with a number of machines built specially for each individual purpose. The equipment supplied with one of these machines consists of two 12-inch circular saws, one for ripping and one for crosscut sawing, one dado head, a boring table, three bits, one 8-inch emery wheel, one 4-inch jointer, with four knives installed, one adjustable iron jointer, a head block, an adjustable rip, jointer and crosscut gauges, a 10-inch sander and a stick of wax for the sander.

The frame is constructed in a most substantial manner, the legs being made of the best quality angle iron, and the girders of maple, while extreme rigidity and strength is secured by extra cross bracings. The frame is securely bolted to a strong 4 x 4 inch yellow pine skid, with two wheels on one end, so mounted that the machine can be moved from place to place as easily as an ordinary hand truck, but allowing it to rest on a substantial base when in an operating position. The table top is 40 x 42 inches, built of narrow maple strips glued and bolted together, with two long bolts extending through its entire width.



### THE PASSING OF THE FARM HORSE

Some of the Many Ways in which the Up-to-Date Agriculturist Economizes by Substituting Machinery for Horse Power

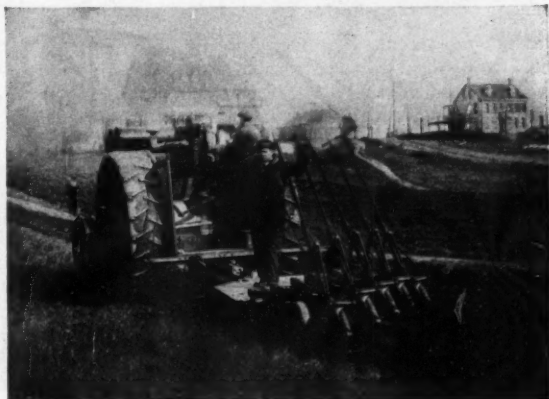
A RECENT issue of the *Herald*, of Sydney, Australia, contained an article under the above title by Hector Fraser, which, while primarily interesting as showing the increasing favor with which traction engines and other power machinery are regarded by farmers in Australia, is also full of suggestions for up-to-date farmers in other parts of the world. For this reason the article is here reproduced almost in full, with a number of illustrations added that have been supplied by several manufacturers of power farm machinery which show how the modern farmer is economizing both man-power and horse-power and getting his work done faster and more thoroughly than ever before.

\* \* \*

It is but a few years ago since many farmers looked askance at the increasing production of machinery. Now, excepting in a few

as though the horse will at no distant date be discarded. The first farm task to which mechanical power was generally applied throughout the country was threshing grain.

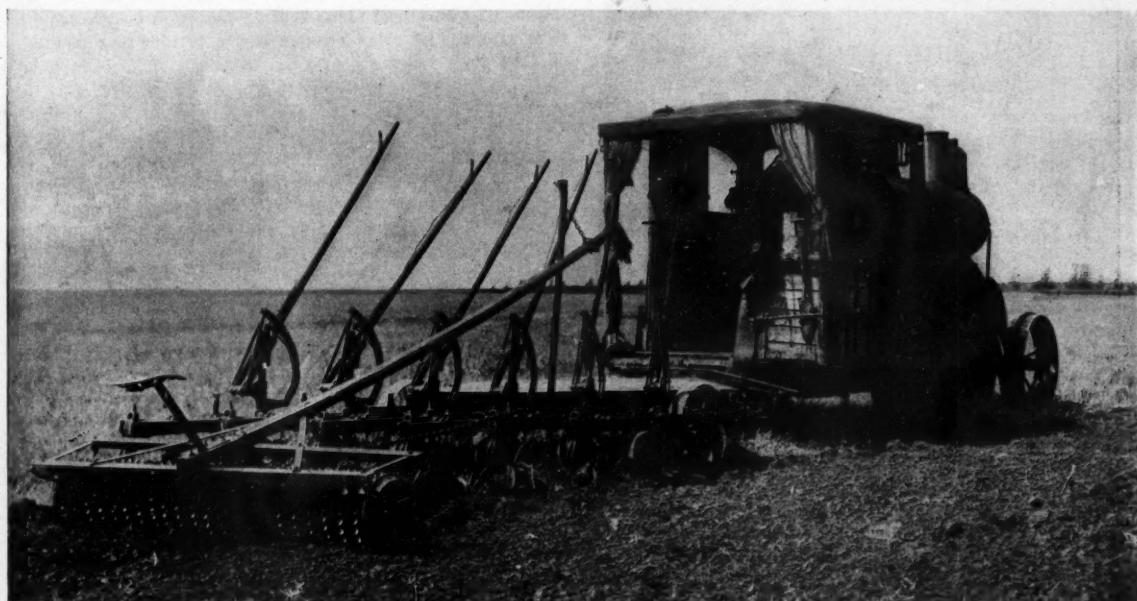
Most persons familiar with country life who have reached middle age can remember when wheat, oats, barley, and other grains were threshed by horse-power, with old-fashioned "chaff-piling" threshing machines. Then the farmer and his sons or hired hands spent days



Farquhar gasoline tractor drawing a five-furrow gang plow, replacing half a dozen horses

or weeks winnowing the grain with a fanning mill turned by hand. This laborious and primitive method of treating grain has been rendered obsolete by steam threshing plants that traverse the country roads, stopping at the farms along the route, and doing the work at a stated sum per bushel. By these modern means the threshing and cleaning of grain is now done in a fraction of the time formerly required, is done better, and, what is more, at a much less cost.

The next important innovation in the way of power machinery for the performance of farm labor to come into vogue was the hay and straw baler. It was quickly followed by machines for shelling



An Avery steam tractor drawing a Parlin & Orendorff "Mogul" plow and packer on a farm near Sioux Falls, South Dakota. This outfit does the work of a score of horses

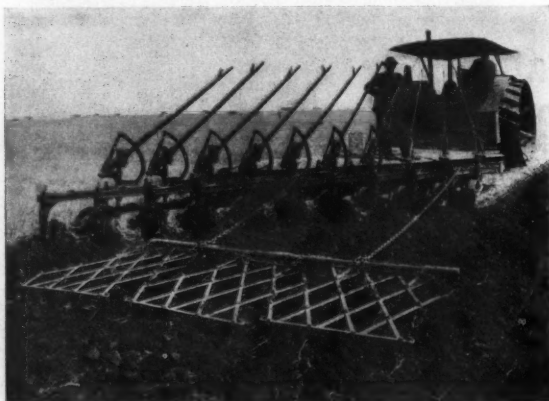
isolated cases, farmers are able to realize the many benefits to be derived from modern machinery, both as regards individual farming and in obtaining a better market for their produce. The large use of machinery plays no small part in keeping the already high cost of living from rising. It used to be jocularly remarked in farming communities that the farmer with his horses and family consumed in the winter all that he produced in the summer. In too many cases the "joke" came near being a plain statement of fact. With the improvement of traction engines, oil motors, etc., it looks

corn. These machines are often taken through the country like the threshers by means of traction engines, and perform their several tasks much more quickly and efficiently than could be done by the labor of horses. Then, after all the threshing, etc., is done, the farmer is able to utilize the traction engine for various other work. He can haul his season's produce into the railway station, haul his necessities of life back to the farm, or, maybe, clear the timber off his uncultivated land.

About twelve years ago an epoch in agricultural development was marked by the introduction of plowing by steam power. This has been one of the factors in bringing about an increase in the value of lands in New South Wales, particularly so in Riverina. Deep plowing is absolutely essential to successful farming in many parts of the semi-arid plains of the Riverina districts. There are quite

\* Readers interested in any of the articles here described may obtain catalogues and prices by addressing SERVICE DEPARTMENT, DUN'S REVIEW, 290 Broadway, New York, U. S. A.

a number of those steam plowing plants to be seen at work in that part at present. In many cases the engine is fitted with a dynamo, and they work day and night. To plow deep was necessarily a costly undertaking previous to the advent of the traction engine and steam plow. With the arrival of these, however, the cost of deep plowing has been reduced to a minimum. The operators of



A ten-furrow "P. & O." Mogul gang plow and toothed harrow drawn by a gasoline tractor

a modern 10-horsepower traction engine (steam) control the power of over 50 horses.

There are at present over 130 steam plowing plants at work in New South Wales, not to mention the large and increasing number of oil tractors. Mr. Britten, of Tamworth, has three traction engines on his farm in connection with the malt industry for his brewery. One of his steam plows weighs over five tons, and will plow 10 feet in width at one cut. A modern steam plowing outfit will travel 25 miles a day, turning approximately 33 acres of land,

Owing to its delicate mechanism, it did not win immediate favor. So rapidly has its mechanism been effected to a degree of simplicity that they are ever becoming more popular, and are giving a great impetus to farming on account of their economical working.

Gasoline was found to be rather expensive fuel as compared with kerosene, so experiments were made to devise an engine that would burn kerosene. Kerosene oil is the most concentrated fuel obtainable at any price, and, what is of much importance to many farmers, seems likely to continue relatively low-priced indefinitely. It is about five years since an internal combustion engine, using kerosene oil instead of gasoline, was perfected. Engines of this type appear to leave nothing to be desired for the perfect adaptation of mechanical power to every farm purpose for which horses have hitherto been considered necessary. An engine of this kind requires only one man for its operation. It costs less than the number of horses necessary to perform the same work, and can be operated and maintained more cheaply. It enables the owner of a farm of any size—large or medium—to put in his crop quickly when every hour's delay means loss, and renders him largely independent of the condition of the labor market—a matter of much consequence at present in New South Wales. Until recently the great objection to the general use of mechanical power on the farm has been on the ground of the cost of suitable traction engines. Some of the steam traction engines used in New South Wales cost over £1,000 each. They are usually mounted on springs, and will climb with perfect ease the highest and steepest hills that can be farmed. None but the owners of large farms are justified in investing so large a sum of money in a traction engine, even though, unlike the horse, it "eats only when it works."

About Tamworth and Gunnedah there are men who have bought power plowing outfits, and who travel from farm to farm plowing, clearing land, etc., on contract, at a stated sum per acre. They do the work for the farmers cheaper, better and more expeditiously than the farmers can do it for themselves.

With the perfection of the gasoline and oil-burning engines, there is little ground for objection to power farming machinery on the ground of its cost. Lighter and cheaper engines, that are nevertheless capable of performing the work on an ordinary farm with ease and efficiency, are being introduced. As the demand for farm engines increases, the wants of the average farmer will be studied and provided for by manufacturers, and there will be further improvements, more perfectly adapting the various types of engines



A Farquhar gasoline tractor and steam thresher outfit on its way to work. Similar outfits are now seen, at harvest time, in nearly every part of the world

at a cost of £6, or about 6s 7d an acre, and the men who operate these machines ride most of the time. The saving of human bone and muscle is no less worthy of consideration than the saving of time and money.

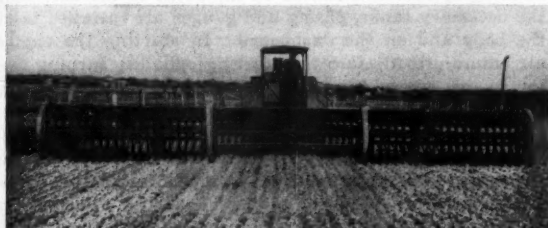
However, there are objections to the use of the steam engine for farming purposes. A large steam engine consumes upwards of two cords of firewood, and uses about 1,000 gallons of water daily. Wood is often scarce, and at the best it is cumbersome to handle, and in many places, especially in the summer months, the securing of an adequate water supply necessitates the use of a man, horse and cart, which, of course, means a considerable expense. In 1903 the gasoline tractor was first successfully used for plowing and various other farm work.

to every farm purpose. Probably few farmers have taken the trouble to figure out a comparison of the cost of the hay, oats and corn necessary to keep their horses for a year, and of the gasoline or kerosene oil necessary to run an engine capable of doing the same amount of labor.

This is really the problem the farmer must solve when he attempts to decide whether it would pay him to farm by mechanical power in lieu of animal power. When farmers begin to figure in this way, it is certain that there are hundreds who now feel that they cannot afford an engine who will come to the conclusion that they cannot afford to do without one.

The owner of Pallamallawa station, near Moree, has proved so extensively the advantages to be gained from mechanical power in

farming that at present he does not use horses for any purpose in connection with farming. Power-farming machinery makes this practicable, without multiplying the farmer's labors or making it necessary for him to reduce his cultivated acreage. He can plow more deeply and cultivate more frequently and thoroughly. With any type of engine, grain drills and harrows can be attached



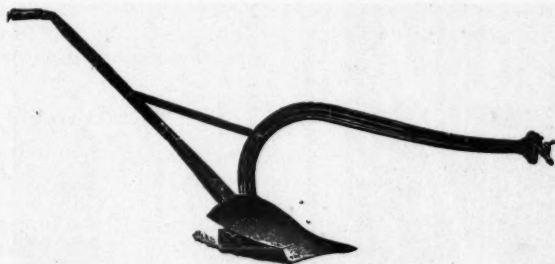
An Avery steam tractor drawing a driller; far too large to be handled by horses

directly behind the plows. Gasoline engines are employed to a large extent for shelling corn, grinding corn, shredding fodder, baling hay, cultivating crops, drilling wells, chaff cutting and for irrigation purposes.

### A NEW PLOW FOR THE PHILIPPINES

THE small single-handled plow shown in the accompanying illustration is the result of efforts on the part of a prominent Philippine merchant to obtain an implement of all-metal construction that would appeal to the conservative nature of the planters in that country, and the rapidly increasing volume of sales of the new plow in all parts of the archipelago indicates that its superiority is being very generally appreciated. In designing this implement the principal endeavor was to obtain the benefit of modern construction and, at the same time, follow the general style of the wooden plow in general use among the natives. It was, of course, necessary to produce a lightweight, simple tool of few parts that could be manufactured and sold at a low enough price to compete with the home article, but which would do good work and be of sufficiently moderate draft to allow of its being pulled by the water buffalo, or carabao. The metal beam was chosen, not alone because it was cheaper and stronger, but also because in a country where it would be subjected to alternate periods of extreme heat and dampness it would not dry out and shrink and split, as would be the case with wood.

With this object in mind the inventor placed his plan before a leading American manufacturer of agricultural



The steel beam and steel handles of this plow make it popular in all hot and humid climates

implements, who agreed to make up 25 of these plows. When they arrived at their destination it was at once evident that they were destined to occupy a high place in popular favor. The first lot was sold almost immediately, and within a few weeks orders for others were received in steadily increasing volume, accompanied by enthusiastic reports of satisfied users. Those who bought them said that they were easier on the animals and did better work than the old-style wooden plow in both the dry upland plantations of sugar, tobacco and other crops, and in the wet, boggy rice fields, besides being readily understood and handled by the ordinary native laborer.

It was not very long before the manufacturers of these

plows were compelled to install special machinery to enable them to meet the constantly increasing stream of orders that were being sent in. The plow will very likely prove suitable for use in other countries where soil conditions resemble those that prevail in the Philippines.

### A NEW USE FOR POST HOLE AUGERS

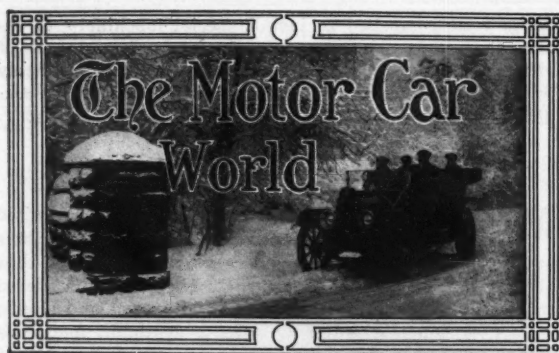
MANY farmers in the western part of the United States have found a new use for their post hole augers, which has added considerably to the value of that already much esteemed implement. They have discovered that with one of these tools it is a very easy and simple matter to bore for water to quite a depth, in numerous instances drilling wells 40 to 60 feet deep. The method pursued is to use the ordinary post hole auger to as great depth as possible, and then detach the handle and substitute therefor a length of pipe, adding more pipe as the



With an ordinary post hole auger, as here shown, and a wrench many farmers are drilling wells very cheaply

depth increases. The turning of the pipe is done with an ordinary trimmer wrench, which gives ample power as the auger penetrates the ground very easily. When the auger is full it is lifted by means of a rope passed through a pulley fastened at the top of a long pole erected adjacent to the proposed well.

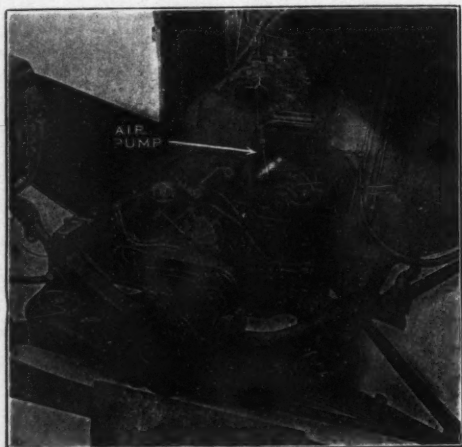
Drilling wells by this method is a very inexpensive and comparatively easy task, and many farmers who can find water at a reasonable depth have found it convenient and profitable to sink them at various places on their farms. Some use ordinary tile for casing after the hole is dug, while others employ either five or six inch water pipe. The post hole auger appears to be exceedingly well adapted for this kind of work, as it will handle all kinds of soil, easily penetrating and lifting shale, sand, gravel, clay or soft earth, and while, of course, it cannot be operated when rock is encountered, will take care of fair-sized stones. It is claimed that with one of these tools a farmer can obtain a well at less than one-fourth the cost of any other method.



### A COMPRESSED AIR SELF-STARTING SYSTEM

Attachable to any Make of Car this Device Places this Luxury within the Reach of Every Owner

**I**N response to the growing demand for a satisfactory self-starter that could be employed on a low-priced automobile, a manufacturer has recently placed on the



Portion of automobile engine showing air pump and air starter in position

market a compressed air system which combines simplicity, efficiency and moderate cost.

connected by a chain drive to the crank shaft of the engine, the usual fan belt pulley being replaced by a combination pulley and sprocket for driving the pump as well as a clutch which engages automatically with the motor when the starter is operated. Another member of the starting system is mounted on the front of the car, while the necessary tanks, piping and gauges are installed below the body and on the dashboard. In starting the engine, air enters directly into the starting cylinder, turning over the motor several times with the minimum shock to the machinery.

All working parts of this system are contained in dust and oil proof casings. Provisions are made for turning the motor by hand in the event of it being necessary to re-time its valves. Rubber tubing is also provided to be attached to the pump of the system so that tires may be inflated without labor or inconvenience. Usually the pump is idle since the reservoir under the car has a sufficient supply of air to start the motor several times, but when the pressure goes below a certain point, a pump control button can be pressed so as to connect the pump to the crank shaft of the engine. A pressure gauge is situated on the dashboard to indicate the air pressure in the reservoir tank.

This self-starting system is largely employed in connection with a low-priced American automobile and is proving highly satisfactory—in most instances rendering the same service as the more expensive starters.

### ODD USES FOR AUTOMOBILES

**I**T would almost seem as though there is no limit to the purposes for which an automobile can be employed, for every day reports are received of new uses to which it has been put. A few months ago a leading farmer in Australia, who had erected a large barn on his property, was confronted with the problem of lifting a large iron water tank to the roof, and as no winch or derrick was available the matter appeared difficult to solve. He was the owner of a large touring car, which he had been using for numerous purposes, among them hauling building material from the railroad to his place with the aid of a trailer, running a saw mill by jacking up the rear wheels and putting on a belt, and pumping, and he wondered if it could not assist him in the raising of the tank. After some study, the proposition was tackled by erecting two poles with a crossbar at the top to which was attached a pulley. A strong rope was run through the latter and then fas-



An antiquated automobile used to drive a feed cutter and silo filler by replacing one of the wheels with an ordinary wooden pulley from which a belt runs to the cutter

This self-starting system can be readily installed as shown in the accompanying illustration. An air pump is

tened to the automobile, which was started, and it easily hoisted the tank to the roof.

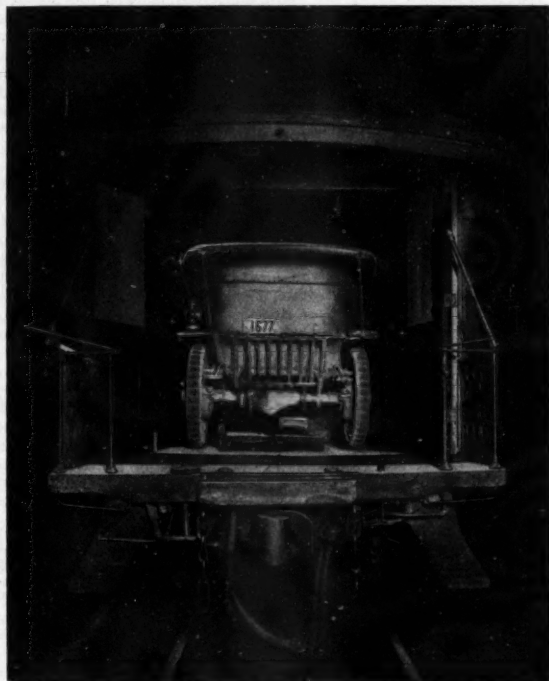
In another instance a farmer in Oregon, who was the possessor of an old runabout which had apparently outlived its usefulness, conceived the idea of utilizing the machine as a power plant. He had a big silo to be filled and

\* Readers interested in any of the articles here described may obtain catalogues and prices by addressing SERVICE DEPARTMENT, DUN'S REVIEW, 290 Broadway, New York, U. S. A.

if his plan proved feasible it would save the expense of buying an engine or the hiring of one from outside parties. The rear of the car was lifted onto a stand so the wheels would not touch the ground, and one of them was taken off and replaced with an ordinary wooden pulley, from which a belt transmitted the power to the cutting machine and blower. The contrivance worked most successfully.

### A NOVEL PRIVATE CAR GARAGE

**I**N the accompanying illustration is shown the novel private car garage of Louis J. Hill, Chairman of the Great Northern Railway Board. This garage serves as a shelter and conveyance for a large six-cylinder motor car.



Courtesy New York Times

A private car garage owned by Louis J. Hill, Chairman of the Great Northern Railway

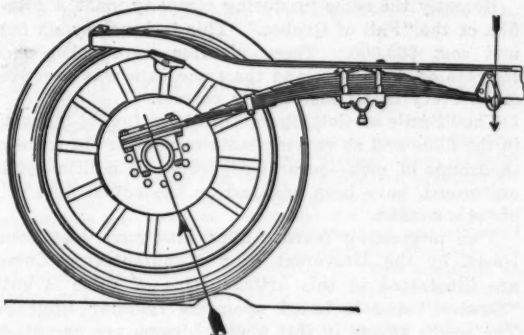
The private car is equipped with every requisite to insure the utmost comfort to the occupants while traveling, and the addition of this novel garage leaves little to be desired in the way of home conveniences.

### UNIQUE SPRING SUSPENSION FOR MOTOR CARS

**A**S in the instance of practically every important part of a motor car, the method of spring suspension has been standardized in all well-known makes. Present-day practice favors semi-elliptic springs for the front and three-quarter elliptic springs for the rear of almost all standard automobiles, other arrangements than this being the exception rather than the rule.

One of the very few exceptions is presented in the design of the rear spring suspension adopted by a leading moderate-priced American automobile. In this particular car, special semi-elliptic inverted springs are employed for the rear suspension, as shown in the accompanying illustration, although the usual semi-elliptic springs are used for the front. Each rear spring consists of an inverted semi-elliptic group of leaves, pivotally supported near its center by a bracket that is securely riveted to the frame of the car. The front end of the spring is attached to the frame by means of a slotted bracket which permits freedom of endwise movement but does not allow any motion sidewise. The rear end of the spring is attached by plates and bolts to a sleeve which pivots on the tube enclosing

the rear axle shaft. In order to secure the utmost resiliency each spring is built up with reverse leaves on the underside—at the center and rear end. These reverse leaves are so formed that they do not stiffen the spring under normal conditions, but only come into action on the rebound, or extreme deflection, of the spring. This feature of the construction minimizes the possibility of breakage and crystallization from excessive bending action.

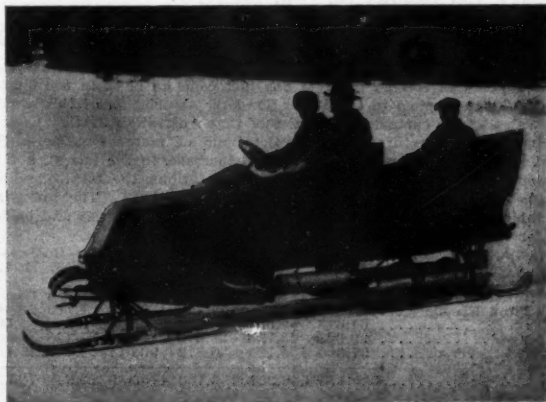


A special semi-elliptic spring for rear suspension of a motor car, obviating shock absorbers

This unique spring suspension is accompanied by many advantages. One of its leading features is that all shocks from irregularities of the road surface are received at right angles to the spring suspension, thus resulting in the minimum jarring of the car, since the shock is relieved by a backward rebound instead of an upward one as in the instance of other forms of suspension. Auxiliary shock-absorbing devices are said to be unnecessary—even superfluous—with this type of construction. Other advantages are the ample road clearance secured and the elimination of side-to-side motion, which is often experienced in motor cars using other forms of spring suspension when traveling over rough roads at high speed.

### A PRACTICAL AUTO SLEIGH

**A**N automobile sleigh, the propeller of which is based upon an entirely new principle, has been under experimentation at Chamonix, France. The propeller consists of two metallic cylinders which are provided with a blade performing a spiral movement. Both cylinders are



A French auto-sleigh capable of a speed of 50 miles an hour on hard snow or ice

connected by a Cardan joint to a gear reducer which is driven by the motor. The cylinders rotate in inverse direction and form, so to speak, a snow propeller. The results obtained have been much superior to those secured with sleighs experimented with thus far, the contrivance developing a speed of fully fifty kilometers an hour on hard and well-frozen snow.

## THE MOTION PICTURE INDUSTRY

(Continued from page 70.)

over the world. The usual life of a film is between six and twelve months. This—"From the Manger to the Cross"—seems likely to be popular for many years. For one thing, since it was made, many of the historic spots have been disfigured by the poles and wires of trolley lines. They never will be the same again.

Recently the same producing company made a four reel film of the "Fall of Quebec." This took nearly six months and cost \$60,000. These pictures were taken on the Heights of Abraham, and the same care was exercised to make every detail historically correct.

The "Battle of Gettysburg" has been fought many times in the films and at varying costs in money. In some cases thousands of men—several regiments of militia—suitably uniformed, have been engaged on the actual field of this historic conflict.

Two interesting feature films that have just been released by the Universal Film Manufacturing Company are illustrated in this article. One of these is entitled "Samson," and is based upon the familiar Bible story. The scenic effects in this picture drama are exceptionally well worked out, with a wealth of oriental color. The other film is entitled "Won in the Clouds," and is a story of South African adventure in which a large dirigible balloon plays an important part, while many of the scenes represent a Kaffir village and others depict lions, elephants and other wild animals in the South African jungles.

There is no length to which the motion picture people—from the humblest to the highest—will not go in order to get a good picture. For instance, the Mutual Film Corporation has just made a photo play in four reels called, "The Great Leap, or, Until Death Do Us Part." It is the old play of passions that is shown so poignantly in "Romeo and Juliet," but in "The Great Leap" the scene is laid in the Kentucky mountains. The heroine and hero are the heritors of two clans that are bitter enemies. The boy and girl lovers elope. They are pursued. Both are on the same horse. The only way of escape is over a cliff 60 feet high. They dash over it and downward into the stream below. Halfway in their fall the boy and girl drop from the horse's back and go down together. It is so thrilling that even the unemotional stage directors who see it on the screen have a sob in their throats when it is projected. Rodman Law, who has risked his neck in more different ways than any man living, plays the hero. "And the heroine" I asked. "Oh, just one of the girls in the company who volunteered," was the reply.

## AMERICAN AUTOS MAKE NOTABLE GAINS ABROAD

A REMARKABLE instance of the popularity of American motor cars in foreign markets has just come to hand in the official statistics supplied to the Motor Traders' Association of New South Wales by the customs authorities of that Australian State. According to these returns total importations of motor cars from the United States showed a very marked increase, in the face of a falling off, particularly in the chassis importations, the total of which declined £22,726 for 1913 as compared with 1912. The following table shows the total imports and the imports of chassis and bodies for the two years under review:

Countries of origin:	Total		Chassis		Bodies	
	1913.	1912.	1913.	1912.	1913.	1912.
United States	166,897	142,647	132,752	113,567	34,145	29,080
United Kingdom	185,638	192,379	157,899	163,710	27,739	28,669
France	51,613	64,682	48,021	62,088	3,592	2,594
Italy	29,027	43,793	28,679	42,907	348	886
All other*	97,300	104,720	85,812	93,617	11,488	11,103
Total	530,475	548,221	453,163	475,889	77,312	72,332

\*Includes Germany, Austria, Belgium, Netherlands, Sweden and other countries.

The total importations into New South Wales from the United States in 1913 amounted to £166,897, whereas in 1912 the importations were £142,647—an increase of £24,250, or more than \$120,000. There is a decrease in the importations from the United Kingdom and the total importations from that country are now only slightly larger than from the United States. Importations from France are relatively very small and there is a decrease of about 20 per cent. in the shipments last year compared with 1912. Italy comes third, and the decrease there is about 30 per cent. The total motor car importations into New South Wales from the United States in 1913 amounted for the year to \$830,000, which for one Australian State, is a very considerable sum.



## THE PHILIPPINES, PAST AND PRESENT \*

UNDER the above title Hon. Dean C. Worcester has prepared a work of two massive volumes that will undoubtedly become one of the classic authorities on the subject of which it treats. First visiting the archipelago as a naturalist in 1886, when he spent a year and visited 18 of the more important islands, and again in 1890-1892, when he spent two years there and visited six more islands, Dr. Worcester was recognized by President McKinley as possessing a broader knowledge about the country and its people than any other American at the moment when the Philippines unexpectedly became an American possession. He was accordingly appointed a member of the first Philippine Commission in 1900 and served continuously as a member of that and the second Commission until 1913—a total residence in the islands of 18 years.

A considerable portion of the first volume is devoted to the Filipino insurrection under Aguinaldo, which broke out just as the first Commission arrived on the scene of its duties and before it had time to investigate conditions or formulate its plans. Much of the material in these exceedingly interesting chapters has never before been published, including numerous translations of Tagalog documents captured from the insurgents. The remainder of the first volume describes the establishment of civil government in the islands, the improvement of health conditions and co-ordination of scientific work, and the building of the famous Benguet road. In the second volume the author describes the great work accomplished thus far toward giving the Filipinos popular education, and devotes several interesting chapters to the non-Christian tribes. Other important chapters treat of Philippine lands and forests, improved means of communication and commercial possibilities, and discuss the subject of Philippine independence. Throughout the entire work, of more than 1,000 closely printed pages, the statements made are of exceptional importance owing to the author's high position as an authority on the subject. The work is illustrated with 128 plates, and has a copious index.

\*The *Philippines, Past and Present*, by Dean C. Worcester, Secretary of the Interior of the Philippine Islands, 1901-1913; Member of the Philippine Commission, 1900-1913. Published by The Macmillan Company, New York. Price, \$6.00 net for the set of two volumes.

## EX-PRESIDENT REYES ON SOUTH AMERICAN PROGRESS \*

A BOOK which derives much of its value and interest from the commanding personality of its author is *The Two Americas*, which was written by Gen. Rafael Reyes, formerly President of Colombia, and has now been published in an English translation.\* Gen. Reyes recently made a trip through the more important South American countries in preparation for this work, his impressions being first published by a leading New York newspaper. His accounts of these travels, and his keen observations regarding economic and political conditions, are of special value as coming from the pen of a trained diplomat and executive. In his opening chapters Ex-President Reyes relates his impressions of Spain, France and the United States; describes his early explorations in South America—which the *New York Times* has said were more important in results than those of Stanley in Africa—and gives his side of the diplomatic negotiations prior to the construction of the Panama Canal. Then follows a series of exceedingly interesting chapters regarding Brazil, Uruguay, the Argentine Republic, Chile, Peru, Bolivia, Ecuador and the author's own country, Colombia.

\*The *Two Americas*, by Gen. Rafael Reyes, Ex-President of the Republic of Colombia; translated from the Spanish, with added notes, by Leopold Grahame. Published by Frederick A. Stokes Company, New York. Price \$2.50, net.

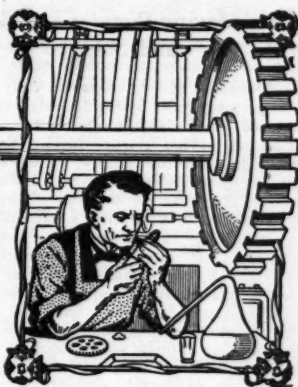
## THE GRAPHIC ARTS AND CRAFTS YEAR BOOK \*

THE sixth edition of *The Graphic Arts and Crafts Year Book*, which is the annual review of the American printing, engraving and allied trades, has just been issued, and in appearance and contents fully maintains the standard set by the earlier volumes. Every user of printing or engraving, as well as those engaged in those lines of business, either as employer or workman, will find a vast amount of valuable and interesting information in the more than 1,000 pages of this book. Thirty-one of the leading printing establishments in the United States and Canada have contributed examples of their finest work, while nearly 40 kinds of paper have been used in this book, so that the effect of various grades and colors of ink can be judged when used in connection with type or with plates or engravings made by different processes.

\*The *Graphic Arts and Crafts Year Book*. Published by the Republican Publishing Company, Hamilton, Ohio, U. S. A. Price \$5.

## Information For Buyers

*As it is frequently impossible for advertisers to explain clearly the purpose or peculiar merits of their products in the advertising columns, space in this section is placed at their disposal to enable them to do so. It is proper to add that they, and not the publishers, are authority for the statements made.*



### A Line of 1, 2 and 3 1-2 Ton Motor Trucks

THE steady expansion in sales and the many expressions of satisfaction received by the manufacturers of the Wichita auto truck, are claimed to be due to the excellent service rendered by the machines already in the hands of purchasers, their good work and durability creating a most favorable impression upon prospective users of this class of vehicle. The Wichita auto truck is made in three sizes, 1-ton, 2-ton and 3 1/2-ton. The chassis of all sizes follow very closely the same general design, experience having shown it to be practically impossible to improve on the style of construction adopted, the main difference being that the parts of the 2-ton truck are larger and heavier, and that on the 3 1/2-ton truck Timken axles and roller bearings are used.

There is, however, an almost unlimited variety of body designs with each size, so that every business can be supplied with the style most suitable for its requirements. Among them are bodies for coal trucks, furniture trucks, ice trucks, grocery trucks, brewery trucks, contractors' dump trucks, lumber trucks, foundry trucks, passenger trucks, etc., and in addition specially designed fire department trucks, street sprinkler trucks and tank trucks for the delivery of oil.

The motor is described as being of the four-cylinder, long stroke heavy duty type. The crank shaft is extra large with long main

and interchangeable. Detachable valve cover plates are provided, making it possible to easily remove deposits of carbon without taking the engine apart. The valves have cast-iron heads, electrically welded to nickel-steel stems, while all of them are located on the left side of the motor and operated by a one-piece cam shaft, which also operates the oil pump. Perfect lubrication is obtained by a combined splash and pump system, with sight



A Wichita truck in every day use in the Island of Cuba

feed on the dashboard. Either kerosene, distillate or gasoline can be used as fuel for these motors.

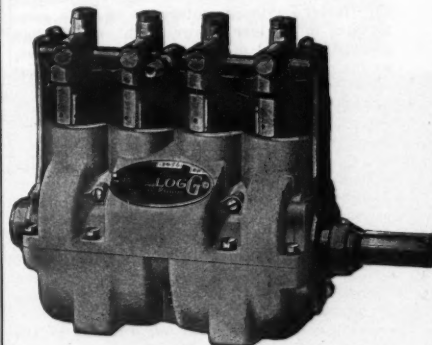
The manufacturers state that they are enabled to put an unusual amount of value into the construction of these trucks for the price at which they are sold because of the fact that their factory is located adjacent to the largest natural gas belt in the United States

manned with a force of chosen mechanics and directed by a corps of engineers of unquestioned ability. These factors, together with splendid railroad and shipping facilities, and an ideal climate, give to the company exceptional advantages for manufacturing, and they are thus enabled to offer the public at a moderate price a motor truck that they claim cannot be excelled for durability and reliability. Illustrated catalogues containing complete specifications, prices and other information, will be mailed without charge to any address upon request. Address the Wichita Falls Motor Co., Wichita Falls, Tex., U. S. A.

### A Practical Mechanical Tire Pump

EVERY automobilist who has ever had to stop on the road to pump up his tires will welcome the Kellogg four cylinder power tire pump, a simple and practical device that can be attached to almost any make of automobile for doing this work, which is being manufactured and marketed by the Kellogg Manufacturing Company, Rochester, N. Y., U. S. A. This invention, as the name implies, is in reality a four-cylinder air pump, the object in making it in this style being to reduce its size, and yet at the same time to provide a steady flow of air without the intermittent strain and jerk that cannot be avoided in a single or double-cylinder pump. That the object sought has been obtained and that its operation gives satisfactory results, is indicated by the fact that this pump has already become a part of the standard equipment on the majority of the leading American cars, and also that practically all manufacturers are making provision for its installation.

While different methods are used for plac-



This tire pump delivers pressure up to 60 lbs. per square inch

ing these pumps in the various makes of automobiles, it will be found a very simple matter to attach the Kellogg four cylinder tire pump to any kind of car.

With every pump are supplied 15 feet of the highest grade rubber hose and a gauge to indicate the amount of pressure on the tire being inflated. All that the automobilist has to do is to connect the rubber hose with the tire and the pump and start the motor and the tire is inflated without any further effort on his part. The gauge supplies accurate information as to the pressure on the tire and consequently the proper amount of air only is injected. The manufacturers claim that every owner of an automobile should have his car equipped with one of these pumps, not alone because of the saving of labor and time that it will ensure, but also because of the resulting economy on the tires, as the absence of a pump or the reluctance of the driver of the car to go to the trouble of pumping them up himself frequently causes him to operate the car with insufficiently inflated or flat tires. Full particulars, descriptive catalogues and prices of this tire pump can be obtained by any interested party from the manufacturers by writing to them at the above address.



A Wichita truck used by the Costa Rica Department of Public Works which effected a saving of 37.50 Colones (\$17.45) per day after deducting all expenses

bearings, provided with case-hardened sleeves, pressed into position and ground to a mirror finish, while special nickel metal is used for all crankshaft bearings. The cylinders and piston are accurately ground and polished, and all parts of the motor are standardized

and in the midst of vast virgin petroleum and bituminous coal fields, which gives them the advantage of an unlimited supply of low-priced fuel. In addition their factory is one of the most modern description, being equipped with the latest automatic machinery,

## Motorcycles with Improved Features

NEW and significant improvements in the building of motorcycles are produced almost as frequently as in the automobile world. The Harley-Davidson machine, for example, comes into the 1914 market with several new features that the buyer will undoubtedly find attractive. Of these the most notable is a step-starter, the advantages of which will perhaps be more thoroughly appreciated by the veteran rider than by the beginner. The device does away completely with the troublesome necessity of pedalling a heavy machine in order to start it, and eliminates the possibility of shearing the ratchets, besides putting an end to the breaking of springs. The rider controls the new device by simply pressing his foot on either pedal, which enables him when sitting in the saddle or standing on either side of the machine to start the motor with practically no effort.

Second in importance only to the self-starter is the Harley-Davidson 1914 brake. Greatly increased power in motorcycles has resulted in their being used to carry heavier and heavier loads, and as a result adequate brakes have become imperative. Double control of the brakes is provided in the new models.

The growing use of side-cars has had an important effect in the designing of the 1914 Harley-Davidson models. In the first place, the new machines are especially well adapted for side-car use. With the step-starter the rider feels no reluctance to shut off his engine at any time, because he can start it so easily. In addition, heavier and longer reinforcements have been put into the frame-loop and rear stays and larger head fittings provided to take care of the additional weight resulting from the use of the side-car.

With the footboards of improved design, the Harley-Davidson motorcycle is made comfortable for a rider of any height, and he has complete control of his machine at all times, as the clutch lever can be thrown in or pulled back by hand or operated by the left foot.

Riders who do much touring have expressed their pleasure over the Harley-Davidson two-speed device, which is known as the "shuttle-shift," owing to the fact that the gears are always in mesh and the change of speed is obtained by a simple shuttle motion shifting a dog-clutch. At low speed the dog-clutch forces the motor to drive through the reduction gear, thereby reducing the speed and doubling the power. As the gears are continually in mesh, they do not clash and there is no possibility of stripping them.

In the designing and construction of the new models great attention has been paid to ensuring noiselessness and cleanliness. There is a non-resonant chain-guard so made as to reduce the noise from this source to a minimum. Other new features may be noted. The carburetor is fitted with an air shutter. Priming cups and priming guns are provided. All Harley-Davidson motorcycles are equipped with Bosch magneto, "Ful-Floteing" seat, the patented clutch known as the Free Wheel Control, and tubular luggage carrier, mounted independently of the rear axle.

Further information may be obtained by addressing the Harley-Davidson Motor Company, 21 E Street, Milwaukee, Wis., U. S. A.

## How Moving Pictures are Made and Sold

FEW readers of this magazine fully realize the magnitude of the industry that has developed since the inception of the manufacture of moving picture films. No doubt many who read this article, and who have often seen the moving pictures in their own town or city, have never given a thought to the difficulties of producing a successful and up-to-date film. It is displayed on the screen and 1,000 feet pass in review within the short time of fifteen minutes, whereas it may have taken a month or more to produce these very same 1,000 feet. It must be realized that it depends entirely upon the weather to make thrilling outdoor scenes, such as balloon flights, falling over cliffs, cowboys riding after bandits, Indians fighting soldiers, etc. A very clear sky is needed for such pictures, in order to get perfect and clear negatives.



Mr. Alexander von Koenig,  
Export Manager of Universal Film Mfg. Co.

Undoubtedly the reader has seen many films that have seemed to be of poor quality. Such films are produced by inexperienced producers, of which there exist a good many in these days, and whose films are offered to the average consumer in foreign countries at prices with which the leading manufacturers of up-to-date films, with the very best photography, good plots and entertaining stories, have no desire to compete. Before writing to these producers of high-class films stating that they have had films offered from such and such factories at prices so much lower, buyers should consider carefully how much the success of their own enterprises depends upon the quality of the films offered to their patrons. The manufacturers of the films made under the "Universal" trade-mark feel

that this important matter should be fully understood by buyers and that due weight should be given to the many points wherein their products excel.

For example, every buyer well knows that he likes to have good and correct reading matter in the titles of the films that are supplied to him. The makers of Universal films fully realize this, and employ the best translators to prepare these titles so that their audiences will not find any fault with wording or spelling, as may have happened with other films.

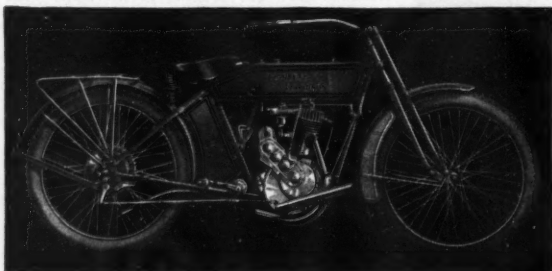
If the reader has never seen one of the films made by the Universal Film Manufacturing Company, a few facts regarding this concern may be of interest. The company claim to be the largest film manufacturing concern in the world, employing over 6,000 people and producing weekly for the world's markets between 26 and 28 different subjects. Among these subjects there are five or six features weekly, of from two to four thousand feet in length each. The remaining subjects are of 1,000-foot lengths and comprise dramas, comedies, western subjects, scenic pictures and current events. The illustrations on page 67 of this issue and of the feature films "Samson," "Won in the Clouds," on pages 68 and 69 and "The Girl and the Bandit," on page 70, show scenes in recent productions by this company. Many of the best actors and actresses in the United States work exclusively in Universal films.

Naturally every buyer of motion picture films desires to secure the very finest program that can be had to display to his customers. Obviously, if he has to use 12,000 feet of new film weekly, a firm making 34,000 to 36,000 feet is in a much better position to supply the right films than some manufacturer making only 12,000 feet weekly, as in that case the buyer would have to take everything that he makes, good or bad, and the result would be a weak program.

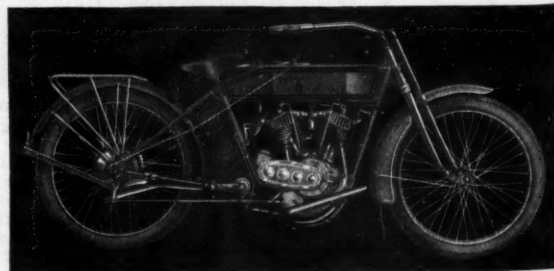
Mr. Alexander von Koenig, the export manager of the Universal Film Manufacturing Company, is prepared to furnish complete and detailed information in answer to any inquiry. Mr. von Koenig states that he has been around the world many times in the moving picture interests and is exceptionally well informed as to just the kind of films needed in each and every country. As already stated, the company, of whose export department Mr. von Koenig is the head, can—by reason of its large and diversified output—give any buyer such a selection for his program as will make the name of his house the best known in the country. If, moreover, there is anything else that the buyer needs in order to establish a moving picture house, such as a portable theater, chairs, projecting machines, curtains, electric generators, etc., Mr. von Koenig can give liberal quotations on such supplies as well.

Mr. von Koenig expects to make another trip through the West Indies, Central and South America some time this year, between June and December, and will advertise his arrival in every important city so that all film importers and exhibitors may consult with him in regard to their requirements. Those who do not wish to wait until then can obtain full particulars, prices, etc., by writing him at the Universal Film Manufacturing Company, 1600 Broadway, New York, N. Y., U. S. A.

Chain driven 5 h. p., single cylinder Harley-Davidson motor cycle, Model 10-B



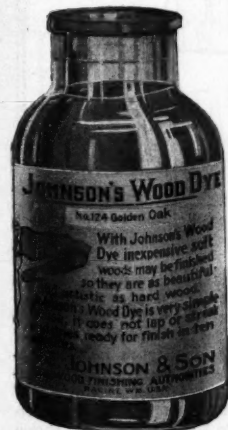
Harley-Davidson 8 h. p., 2 speed, twin model 10-F for cross-country or side-car work



## Wood Dyes and Finishes

EVERYONE is interested in beautifying the home, and articles intended for this purpose consequently meet with a wide demand. This is particularly true of the line of wood finishes manufactured by S. C. Johnson & Son, Racine, Wis., U. S. A.

This comprises "Johnson's Prepared Wax," a complete finish and polish for all furniture, woodwork and floors; "Johnson's Wood Dye," for the artistic coloring of both soft



Glass container of "Johnson's Wood Dye."

and hard woods; "Johnson's Under-Lac," a spirit finish claimed by the manufacturers to be much superior to shellac or varnish; "Johnson's Flat Wood Finish," for giving a hand-rubbed effect without the expense of rubbing; "Johnson's Paste Wood Filler," for filling the grain and pores of wood and preparing it for the finish; and "Johnson's Powdered Wax," for ballroom floors. One of the containers in which the Wood Dye is put up is illustrated herewith, but there are many other ways, including cans of various sizes with attractive labels for the different products enumerated.

The firm publish a very beautiful booklet on "The Proper Treatment for Floors, Woodwork and Furniture," which is illustrated in colors and contains a great deal of very useful information as to which preparation to use for each purpose and exactly how to apply it. Another interesting publication is a booklet with real wood covers and containing many examples of actual woods of different kinds treated with one or another of the special preparations made by this concern, so as to illustrate the exact appearance of each finish when applied to each particular wood. For copies of the export literature issued by this concern, together with export price lists and full particulars regarding foreign selling terms, address the manufacturers direct as above.

## Ceiling, Desk and Bracket Fans

THE Robbins & Myers Company, of Springfield, Ohio, U.S.A., have just issued a very handsome catalogue, No. 130, with illustrations in several colors, describing and illustrating their ceiling fans, desk fans, oscillating fans and exhaust fans, for both direct and alternating current circuits. This catalogue should be in the hands of everyone interested in or handling electric fans of every description as it is very complete and includes full information so that intending buyers can order from it direct without loss of time in further correspondence. In writing for this catalogue, request export terms and discounts.

## Crude Oil and Gasoline Engines

A LINE of semi-Diesel crude oil engines, comprising both marine and stationary types, is being marketed in all parts of the world by the manufacturers, the Anglo-Belgian Company, Ltd. These engines are made in standard sizes of from 10 to 75 horsepower and are extensively used for electric lighting and pumping stations and for other forms of service requiring moderate power in localities where gasoline is not available or, for any other reason, crude oil is preferable as a fuel.

This firm also are extensive makers of a line of gasoline engines to which they have given the trade name of "Onghena." Every part of these engines is made in the same factory with the very latest and best machinery, and each piece is inspected and tested before the engines are set up. After assembling, each engine is given a severe test under its own power with a varying load so that the horsepower can be positively determined and the governor properly set. The manufacturers guarantee that no engine leaves their works unless in perfect running condition and agree to replace free of charge any piece that fails to give satisfaction.

Among other claims made for "Onghena" engines, are that they start easily, run smoothly, are governed like a steam engine, that every part is interchangeable and that they are exceedingly economical. The main bearings are made in three sections, of which the largest supports the weight of the flywheel and crank shaft, and absorbs the shock of the explosions. These bearings are easily adjustable and can be readily removed without dismantling the crank shaft. The governor is of a special type, simple in construction and cannot be disturbed by dismantling valves. By means of this device, the amount of gas and air admitted to the cylinder is in exact proportion with the amount of work to be done.

All engines are fitted with a low-tension magneto ignition and the spark plug is so arranged that it can be easily removed for cleaning without disturbing the rest of the engine. The facility of taking the engine apart for cleaning and adjusting is a special feature to which the manufacturers direct at-

The manufacturers supply a list of all the parts of these engines numbered so that extra parts can readily be ordered if needed. Additional particulars regarding this line of gasoline engines, which is made in all sizes



An electric power station equipped with "Onghena" suction gas engines

from 4 to 200 horsepower, will be furnished on request. Address Force & Mekanique, Soc. An., 23-25 Rue du Hainaut, Ghent, Belgium.

## Mosaic Tiling for Floors and Walls

CERAMIC mosaic tiling for the permanent covering of floors and walls has been known for hundreds of years, but until within a comparatively recent period its use was confined to churches and other public or semi-public buildings on account of the expense of installation. Its many advantages, both from a sanitary and artistic standpoint, how-



Corridor of the Grunewald Hotel, New Orleans, showing Ceramic Mosaic Tile flooring in designs suitable for an elegant interior

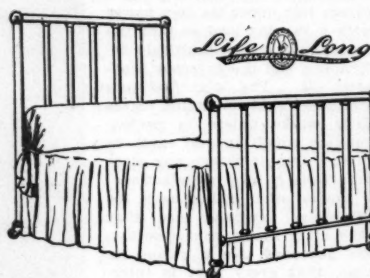
ever, have resulted in its use being extended to practically all classes of buildings, modern methods of production so reducing its cost that its application is possible to-day in many installations, where formerly the expense would have been prohibitive. Among these may be mentioned the floors and walls of kitchens, bathrooms and halls of private dwellings, apartment houses, shops of all kinds, hotels, hospitals, sidewalks, etc.

While the initial expense of laying mosaic tiling is considerably above that of ordinary wood flooring, in the long run it is by far the most economical, for when once properly done it is practically everlasting. In addition, the beautiful combinations that can be produced with this material render carpets or rugs on the floors or wallpaper or other coverings for the walls unnecessary, which in itself is a source of considerable saving. Another great advantage that is by no means to be despised is the ease with which tiling of this nature can be kept clean, an occasional washing or wiping with a damp rag being all that is necessary to keep it in immaculate condition.

At one time the use of ceramic tiling was retarded by the fact that its installation called for the employment of expert workmen, which made the cost far too high for the person of average means, but to-day a system that has been devised by the Mosaic Tile Co. (Export Dept. D., 30 W. 24th St., New York), renders it possible for almost any one to do the work and obtain perfect results, thus enabling people living in places where regular tile layers cannot be obtained to install these walls or floors themselves.

The Ceramic floor or wall tiling supplied by this company is mounted on sheets of paper, 24 inches long by 12 inches wide, with the face of the tile against the paper, which not only facilitates its laying but admits of almost unlimited possibilities in design and color combination. With every order there is furnished a laying plan, with numbers on the sheets, which makes the placing of the figures a matter of extreme simplicity. The company states that the use of their tiling is rapidly expanding in foreign countries, especially in hot, damp climates, as it is not affected by weather or temperature. When shipped abroad the tiling is packed in strong boxes lined with waterproof paper, and bound with bands of steel. Each box contains about

manufacturers, and others, who are planning the erection of new buildings, and if the designs shown in their catalogue are not just what is wanted by the customers, they will be glad to make up special designs from his tracings or blue prints, or, if the architect would prefer to have his own designs worked into tile, they are equipped to do so.



Two styles of nickel plate finished "Life Long" beds, which are claimed to be cheaper and less liable to tarnish than brass

Burned clay tiles are coming more and more into favor, and great care is taken in their manufacture. While their first cost may exceed that of cement and hydraulic tiles, they are much less expensive than marble, and far more durable than either. For instance, it is characteristic of marble and cement tiles that they absorb moisture, whereas the burned clay tiles are absolutely impervious to it. And again, while the surface of marble is easily scratched, the effect of steel on the surface of Ceramic Mosaic Tile is practically nothing, only a slight pencil-like mark being noticeable. For these reasons, burned clay tile will be found the most desirable for all modern buildings, both from the artistic and practical standpoint.

been the fact that it was bright and clean—it was seldom the beauty of its design that appealed to customers, as this was generally plain.

Merchants, however, have been reporting a slight falling off in the demand for brass beds of late, due in part to the fact—as they generally express it—that "everybody has a brass

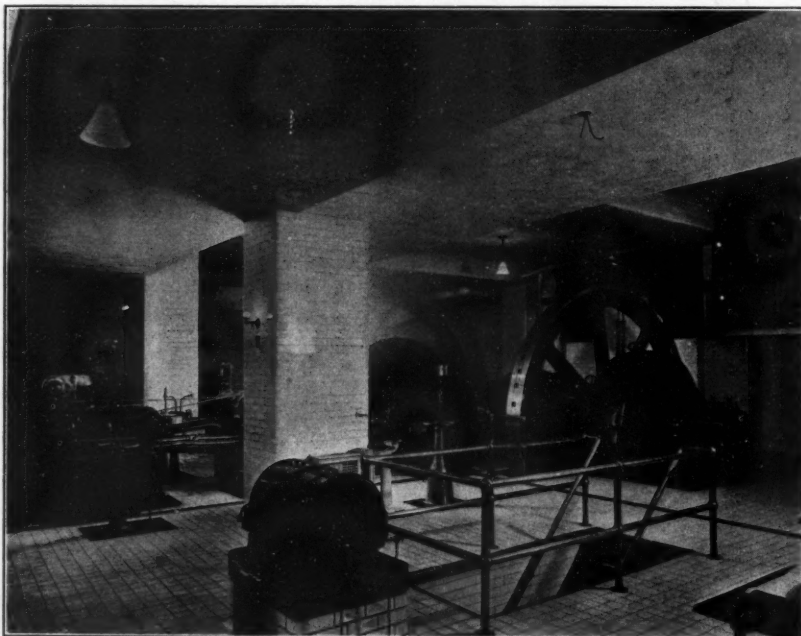
bed now." In fact they have undeniably become very common and consequently customers about to put money into a high-class bed are anxious to get something different.

These factors have made the Hard Manufacturing Company, of Buffalo, N. Y., experiment with a view to creating an entirely new kind of finish, which has finally been perfected and applied to the two new beds shown in the accompanying illustrations. These beds are finished in nickel plate, which has the appearance of polished silver and the permanence of high-class steel. Not being brass, they are not subject to the excessively high duties that that metal often has to pay, and are also less liable to tarnish. Furthermore, they are somewhat cheaper in original cost, f. o. b. vessel, New York, and are even brighter in appearance, while retaining all the air of cleanliness that made the brass beds so attractive. In addition to the two styles shown in the illustrations, the firm are offering the export trade a third style, so as to give a sufficient variety to appeal to any taste.

Orders are already being received by the Hard Manufacturing Company for these beds, and many foreign dealers are finding it worth while to order all three patterns of this new finish as samples to try out in their own market. Inasmuch as this experiment is likely to result in the discovery of a very successful novelty in the bed line, the firm are offering the three styles as samples for about \$45, f. o. b. New York, export packing free. For further particulars, address Hard Manufacturing Company, Buffalo, N. Y., U.S.A.

### Rubber Engineering Requisites

**B**UYERS of such engineering requisites as sheet packing, gaskets, pump valves and like supplies will be interested in a booklet describing the mechanical rubber goods manufactured by Jenkins Brothers, 80 White Street, New York, U. S. A. Included among the specialties shown are square and round hole discs in various compositions for steam service, hot water service, hydraulic pressures up to 250 pounds, and steam pressures up to 100 pounds; pump valves for cold, warm and hot water under various pressures; packing, which is claimed to be so flexible as to bend easily without cracking and to be non-rotting and non-burning; gaskets, which are furnished unvulcanized, as is the regular sheet packing, or vulcanized, if desired; gasket tubing, bibb washers, union rings, washers for gauge glasses, etc. The company's "Jenarco" sheet packing is described as being a new product suitable for severe service. It is a high-grade semi-vulcanized sheet rubber which makes a very durable joint under pressures of steam, hot or cold water, or other liquids, and can be easily applied. Gaskets cut from sheets of this packing can also be furnished. Buyers of rubber goods for engineering and plumbing service can secure copies of this pamphlet by addressing the company as above.



The engine room of the Woolworth Building, where Ceramic Mosaic Tile was employed for both flooring and side walls

55 square feet and weighs about 150 pounds. The company has prepared a very handsome catalogue, in which there are a number of reproductions in colors of the combinations possible with this tiling, and also illustrations of places where it has been used. Copies of this catalogue, in English or Spanish, will be sent without charge to any address upon request.

Correspondence is invited from architects and builders, as well as from merchants, man-

### A New Type of Bed

**D**EALERS handling brass beds will be interested in an innovation just put on the market by an American manufacturer. This concern has found that while brass beds have been very popular in the export trade, their sale has been restricted by the very high duties imposed upon them in many countries, and the great danger of tarnishing. The great advantage of the brass bed has always

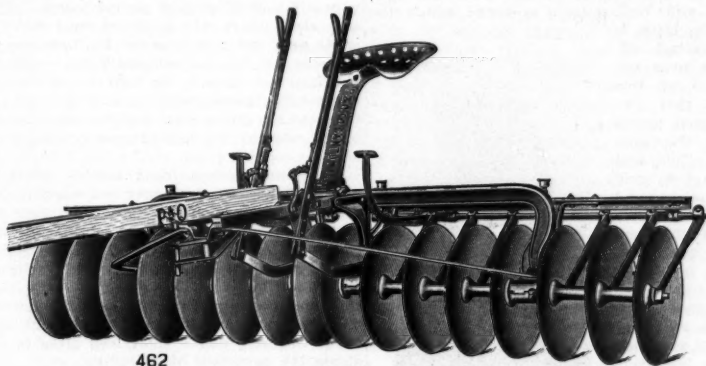
### Disc Harrows for Many Uses

THE disc harrow is a most valuable implement on the farm. It is a perfect pulverizer, preparing the ground for the seeder or planter. All trash and stalks are cut up, producing a mulch of fine loose dirt which prevents undue escape of moisture. It should be used before and after plowing so that all possible moisture is conserved for the produc-

builders of such amusement places because of its fire-resisting, sanitary, durable and generally attractive qualities. The Canton Metal Ceiling Company, 1951 Harrison Avenue, Canton, Ohio, U. S. A., manufacturers of metal ceilings, sidewalls, shingles and roofing tile, retain a staff of artists for the working out of new conceptions in metal and have recently issued a special catalogue of 24 pages illustrating and describing a number of distinct styles for theater fronts and many

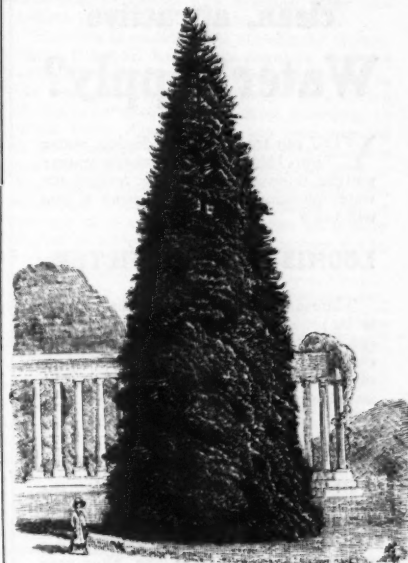
ticularly adapted to producing the finest possible results, whether in the production of high-grade vegetables, fruits or shade trees.

Some idea of the importance of the firm



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The "Canton" disc harrow, which has an arch of T-bar steel, making an exceptionally strong frame. No weight boxes are required with this harrow



The nurseries contain more than 15,000,000 young forest trees of all kinds

and the magnitude of its production can be obtained from the fact that its nurseries cover more than 160 hectares, or fully half a square mile, and produce annually 15,000,000 forest trees and shrubs of all kinds, 10,000,000 fruit-bearing shrubs and 80,000 fruit trees, 6,000,000 ornamental shrubs and more than 1,000,000 grafted rose bushes. Among the latest of the creations of the firm in the last mentioned line are the well-known Madame Norbert Levassasseur (or Baby Rambler) "Mistress Cutbush," "Maman Levass-

tion of the crop. By using a seeder attachment, various grains, such as oats, wheat, flax, barley or rye, can be sown while disking.

The Parlin & Orendorff Company are now offering for export the P. & O. "Canton" disc harrow which has many special features that will recommend it to the discriminating agricultural implement buyer. The arch is of T-bar steel, which makes the strongest frame known. The gangs are swiveled directly on the ends of the arch and the proper angle of the gangs has been scientifically computed. No weight boxes are required, because the correct angle to make the harrow take to the ground has been carefully figured out. The inner ends of the gangs are held firmly down so that the center of harrow cannot rise out of the ground; but they can readily adapt themselves to low places in the ground. The maple bearings are boiled in linseed oil until thoroughly soaked, which gives long life to the bearings. The spools between the discs are exceptionally heavy, giving added strength. The scrapers are of flat spring steel and are operated by foot levers to cover the entire surface of the discs.

The "Canton" harrow is made in widths of from 4 to 10 feet, and with 16, 18 or 20-inch solid or cut-out discs. All sizes are built with two levers, which give individual control of the gangs, and are furnished with eveners.

Buyers of agricultural implements or others interested should write for the company's illustrated circular No. 25, which is devoted to a description of this harrow, while prices, shipping weights and other details will be added on request. All communications should be sent to the Parlin & Orendorff Company, Export Dept. D. R., Canton, Ill., U. S. A.

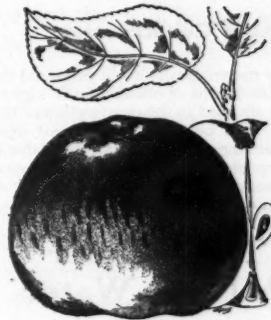
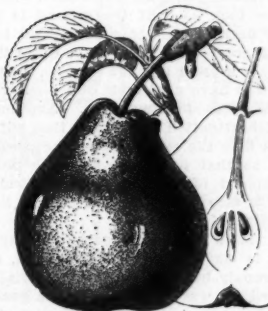
### Metal Fronts for Theatres

SHEET metal in artistic designs for the exterior and interior of moving picture and other playhouses has been used to an increasing extent during the past few years by

patterns for interior use on ceilings and walls.

### Plants, Trees and Shrubs

THE city of Orleans, France, is known throughout the world as one of the leading horticultural centers. One of the largest nurseries in Orleans is that of Levassasseur & Fils, which was established in 1773, and which is known for its extensive grounds, for the superiority of its products and for the fact that it has been actively engaged in exporting plants to all parts of the world for over a half century.



Among the leading specialties of Messrs. Levassasseur & Fils is the production of special types of luscious pears and other fruits for which southern France is famous

Owing to the scientific manner in which this firm has utilized the various soils in the vicinity of Orleans, its products have proved adapted to the requirements of buyers in all parts of the world. These range from the rich, sandy soil of the River Loire to the fertile region around Orleans itself, including the light soils of Sologne and the rich alluvial deposits of the Val—each possessing a different quality and thus being par-

seur" (or Baby Dorothy), "Mistress Taft" and "Orleans Rose."

The firm of Levassasseur & Fils will gladly furnish horticulturists and import agents with full particulars in any language regarding its products. Owing to its long experience, the concern is in a position to give immediate attention to all orders and to pack plants in such a manner that they will arrive in proper condition at remote destinations.

## PIANOS AND PLAYER PIANOS OF SUPERIOR QUALITY

The result of many years of effort and thoroughly tested in all climates

Magnificent Instruments at Fair Prices

Catalogues and further information always at your service

WINTER & CO. SOUTHERN BOULEVARD  
NEW YORK CITY, U. S. A.

Please mention DUN'S REVIEW when writing to Advertisers, and give ADDRESS IN FULL, including Province and Country.

## Have you a clean, attractive Water Supply?

**YOU** can transform the dirtiest water into bright, clear, sparkling water; you can remove odor or taste, making the water pleasant and safe to drink if you will use a

### LOOMIS-MANNING FILTER

The reason why these filters have come to be recognized as the leading filters for use in office buildings, hotels, hospitals, country homes, city homes and all kinds of manufacturing establishments may be stated briefly as follows:

#### Simple to Operate

The filter is cleansed by reversing the flow of water, which is accomplished by the movement of one lever operating the Manning Single Controlling Valve. This valve makes the care of the filter very simple and makes mistakes impossible.

#### Effective Results

The filter produces splendid results over long periods of time because the filter bed is kept in good condition by our system of cleansing it. The Loomis Cutting plate through which the bed passes under the action of the washing current breaks up the bed so that every particle is cleansed. The entire bed agitates every time it is washed. All accumulations are driven off through the waste line and the sight glass into any convenient sewer or drain.

#### Durable Construction

Only materials which will withstand the corrosive action of water to the highest degree are used in the construction of this filter. The outside casing is cast iron, the Manning Single Controlling Valve is solid bronze, the screens are tinned copper, pipe work is either galvanized iron or brass as desired.

## They Filter All the Water

The entire water supply entering a building or residence, the water used in manufacturing, for bottling purposes or for boiler use can be made bright, clear and attractive. The filter is attached to the main supply pipe so that every drop of water passes through it. Full instructions for connecting up and for operating are sent with each filter.

The filters are built in many different sizes, styles and capacities. Inquirers should state the quantity of water desired to be filtered per minute or per hour, the condition of the water to be filtered, the pressure available, and the size of their supply pipe.

**Loomis-Manning Filter Mfg. Co.**

131 South 16th Street

Philadelphia, Pennsylvania, U. S. A.

Cable Address: LOOMISMAN, W. U. T. Code

### Easy Working Post Hole Augers

**F**OR many years the firm of Iwan Brothers, of South Bend, Ind., U. S. A., have been favorably known as manufacturers of a reliable line of hardware specialties, among which are included a number of implements designed especially for the digging of post holes and wells of moderate depth. Their most recent production of this nature is known as the Iwan Patent Improved Post Hole and Well Auger, a device which the makers claim is

a marked advance over any article of this kind that has yet been placed upon the market. This tool is said to possess several original features that enable the operator to dig a hole with remarkable rapidity in any kind of soil and with much less exertion than by any other means. Very little pressure on the bar is necessary, as the formation of the blade causes it to operate like an auger, a twisting motion, which the great leverage afforded by the long handle renders very easy, being all that is called for, the penetration into the ground being otherwise automatic.

In this improved auger no trouble is experienced in lifting the soil from the hole when it happens to be sandy and dry, the blades interlocking at the bottom when raising the tool, so that the ground is held as tightly as if it were in a box. This is a feature of great advantage, as it saves in many instances a great amount of time, a fact that those who have used tools of a similar nature will be quick to appreciate. Another point to which attention is called is that with these tools a hole the exact size of the post can be bored, so that not alone does the post have the support of the solid undisturbed earth, but it is also much less likely to be lifted by the action of the frost.

The Iwan improved post hole and well digger is made in ten different sizes, and being strongly built of the best materials to be obtained its wearing qualities are practically indefinite, unless it should be broken through accident. When this happens, the damaged part can be easily replaced at a very slight cost, as every section of the tool is interchangeable. Farmers, stockmen, telephone and telegraph companies, and in fact anyone who has a fence to erect or to keep in repair will find one of these augers a profitable investment, as the price is very low considering the amount of labor and time that can be saved by its use. Catalogues, prices and other particulars can be obtained by writing to the company direct at the above address.

### A Marine Motor with Many Special Features

**T**HE Kermath Manufacturing Company of Detroit, state that they are the only concern in the marine engine business devoting their entire time and attention to the production of one article, or specializing in a single engine exclusively. They have built this one-size engine for three years, and will continue the same model for 1914.

The makers claim that this engine embodies the finest materials they can obtain and that

the workmanship is equal to higher priced motors in this particular size and type. The engine is of 4-cycle construction, having 4 cylinders cast in pairs, of the L-head type, with the water jackets cast integral, and the valves seating directly in the cylinder casting.

The cylinders have a bore of 3½ inches and a piston stroke of 4 inches. The crank shaft, cam shaft and connecting rods are all 40 point carbon steel drop forged with all of the cams integral, and the gears are put on with a Woodruff key and pinned besides. The cam shaft gears are made of steel for the small gear and grey iron for the large gears, and are all cut on automatic gear cutters. Bearings are all of die cast nickel babbitt and readily interchangeable, and by removing the bearing cap a new bearing may be inserted without the necessity of pouring babbitt.

The oiling system for a marine motor is noteworthy, in that it does not require any grease cups anywhere on the motor, and the entire motor is lubricated by splash system, which consists of a reservoir in the engine base, a float feed to determine the quantity of oil in same and a plunger pump operated from the cam shaft to a mechanically maintained oil level in the splash pockets under each connecting rod, and a sight feed glass to indicate the operation of the pump.

The crank case is made of close grained grey iron, and in special instances where required, of aluminum. The pistons are close grained grey iron and are machine finished, heat treated and then ground and have bronze bushings fitted in the the hubs to take ⅝-inch piston pins which are hardened and ground and made from solid bar stock bored out to reduce the weight. The pistons are 4½ inches long and are fitted with three piston rings and three oil grooves at the bottom.

The main bearings are 3½, 2½ and 3 inches long, respectively, the center main bearing being held up by a single stud and the longer main bearings are fitted with two studs on each side, insuring a full bearing surface.

These engines are fitted with various equipments such as 4-cylinder coils and timers, Kingston Dual Magneto and coil complete, and the Bosch Dual Magneto and Coil, all sold at various prices.

For descriptive literature, fully illustrated, and explaining in detail various advantages claimed by the manufacturers for the Kermath motor, the parties interested should write to Kermath Mfg. Co., 45 East Fort Street, Department 12, Detroit, Mich., U. S. A.

### How a Strong Distributing Organization Promotes International Trade

**B**EFORE admitting that the middleman who stands between the producer and the consumer is economically superfluous, it is important to understand clearly his functions. It is no doubt true that the shortest route between these two indispensable factors to industrial and commercial activity is the cheapest when the articles produced are consumed in their country of origin. The situation is entirely different, however, when one desires to purchase in some distant country an article that he proposes to introduce into his home market, whether it be to supplement a shortage in domestic production, or because of the cheapness or renown of the product in question. Under such conditions, it is unquestionable that the honest merchant, who understands his business and the requirements of his customer, is a most useful link between the manufacturer and the buyers overseas.

There are many reasons for this, but it will be sufficient to mention a few in order to convince those who have not given the subject careful consideration. At the outset it is proper to state that the rule here laid down is not necessarily of universal application, but relates more particularly to raw materials which are sold either in the rough or partly finished, such as window glass, mirror glass, cement, etc. The manufacturer

who produces merchandise of this kind is limited by his output, or the capacity of his plant, so that he is not under that incentive to develop his business which acts as a spur to the ordinary merchant. The result is that if he has great technical ability he is apt to pay scant attention to the requirements of the buyer, especially if the latter is in a foreign country. He cares little for the loss of a client, provided he is replaced by another, since he requires only enough to take care of his output.

The manufacturer feels that it is his interest to regulate the amount of his production so as to be sure that it is completely consumed, thus keeping supply and demand as evenly balanced as possible. With this object in view, associations have been organized whose principal purpose is to regulate the sale of certain products by fixing rigidly prices and terms. This policy, however, overlooks the rights and requirements of the buyers and if carried to its utmost extreme would result in bringing trade to a deadlock—at least as far as international transactions are concerned. It is right here that the large mercantile house finds its opportunity, and its reason for existence, in bringing manufacturers and buyers together on common ground.

This is the position occupied by the firm of Emile Regniers & Cie, of Charleroi, Belgium, which is one of the oldest in the country and

one of the largest in its line. The firm is engaged in exporting to every country in the world the following articles: Window glass of every description and of all sizes, polished and silvered glass, metals of all kinds, wire nails, wire, and artificial Portland cement. The firm state that they export more than a third of the entire Belgian output of window glass. In order to better understand the requirements of their clientele the Messrs. Regniers, both father and sons, as well as their salesmen, have visited every part of the world and, having familiarized themselves with the dangers involved in shipping and handling their product, have devoted particular attention to making the packing especially strong and durable. Furthermore, numerous inspectors go through the factories every day to supervise the execution of orders and see that the packing is carefully done. The same supervision takes place in Antwerp and the other different ports of shipment, where an experienced staff of employees see that all goods are properly placed on board steamers.

In short, the organization of this concern is such that buyers may safely send their orders to them in the lines above mentioned with confidence that they will be executed with the utmost care and exactness. Furthermore, the reputation of the brands handled by this house is universal, particularly as regards window glass, which has been their

specialty for many years. Some of their leading brands are shown herewith, and are very highly regarded in the trade. The firm have built up their reputation by giving prompt attention to orders and treating their customers in a straightforward manner.

The firm is owned in its entirety by Messrs. Emile Regniers, Sr., Emile Regniers, Jr., and Arthur Regniers, who are engaged jointly in the management of the business. In addition to the experience of these three directors, of whom Emile Regniers, Sr., has been engaged in the business for over forty years, the firm has the assistance of an experienced staff of department heads, some of whom have been connected with the house for more than a quarter of a century. All letters of inquiry should be addressed to Emile Regniers & Cie, Charleroi, Belgium.

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(Signed) WILLIAM A. CRANE, Manager.

Sworn to and subscribed before me this 19th day of March, 1914.

PETER R. GATENS,  
Notary Public No. 21,  
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(Seal)  
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